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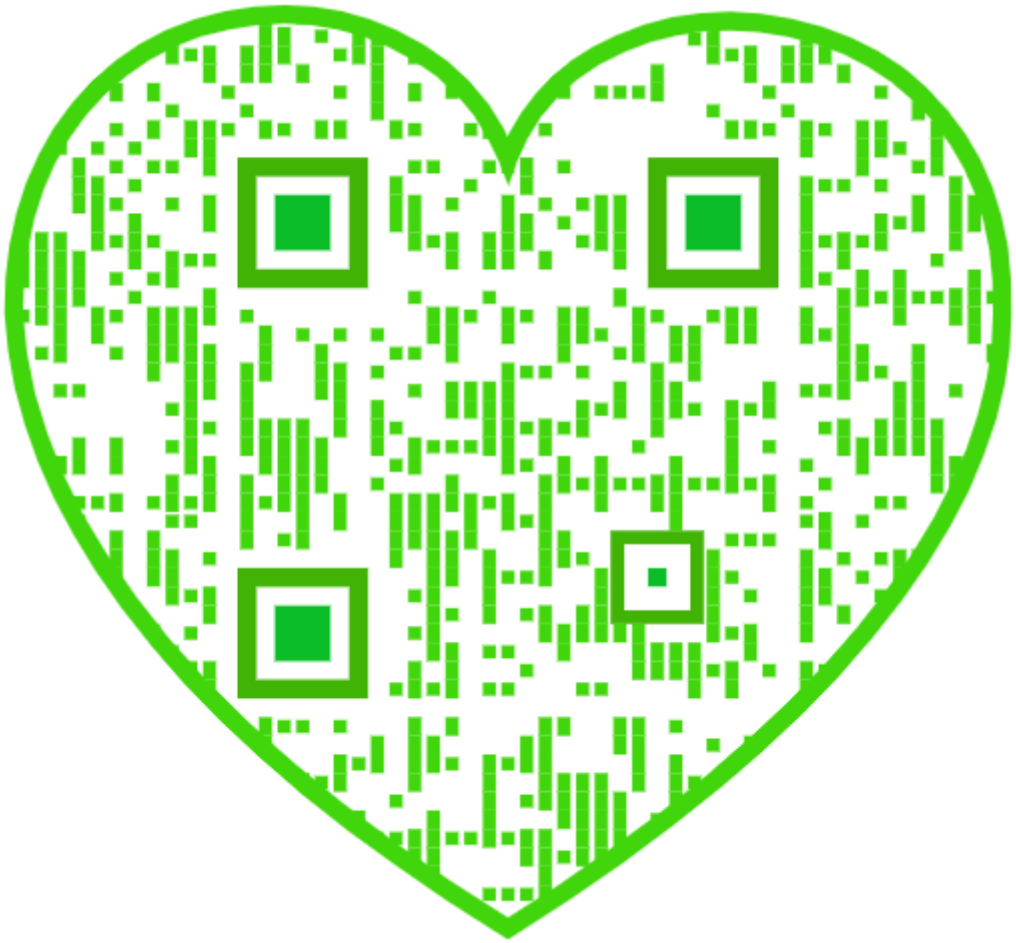
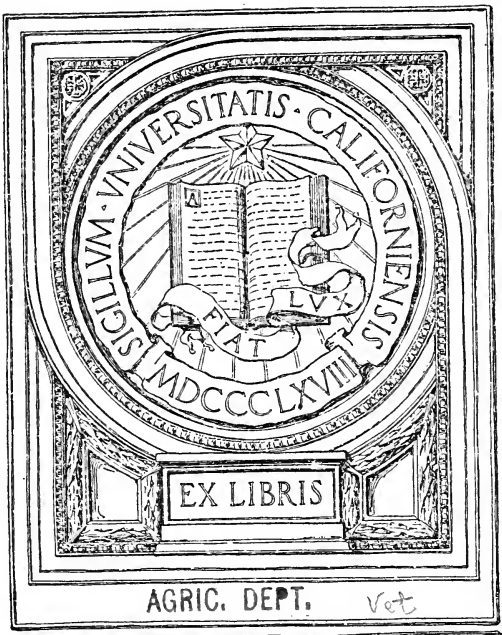
LEHMAN'S
POULTRY DOCTOR





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H. H. LEHMAN, V. S.

LEHMAN'S

POULTRY DOCTOR.

A Treatise on Poultry Diseases, written in plain Language for the Farmer and Poultry Raiser.

—BY—

DR. H. H. LEHMAN

A Graduated Veterinary Surgeon of vast experience with Poultry and their Diseases, and ex-secretary of the Veterinary Associations of the Detroit College of Medicine and of the Indiana Veterinary College.

With ideal illustrations of leading breeds of poultry, also an Appendix of a number of important subjects.

Published by the author,

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PREFACE.

BOOKS dwelling absolutely on poultry diseases, written in plain language by veterinary medical authors, are few.

The present book is an effort to at least partially fill this gap. In compiling this small book, the writer endeavors to base it on sound medical facts, such as can be obtained from the best veterinary writers of this country as well as from foreign authors, and from his own experience, and to give it in such language that the common poultry-raiser may be able to comprehend it.

The description and treatment on the several poultry ailments will be as brief and practical as it is possible to make them, and yet do justice to the immense poultry industry.

The following authors have been freely consulted: The Diseases of Poultry, by D. E. Salmon, D. V. M.; Prof. Law's Veterinary Medicine; Friedberger & Frohner's Pathology and Therapeutics of the Domestic Animals; Chauveau's Comparative Anatomy; Winslow's Materia Medica, and numerous others treating on Veterinary Medicine and Poultry Raising.

The author also desires to record his obligations to his preceptor, Dr. Gilbert Hess, of Ashland, Ohio, for valuable information.

H. H. L.

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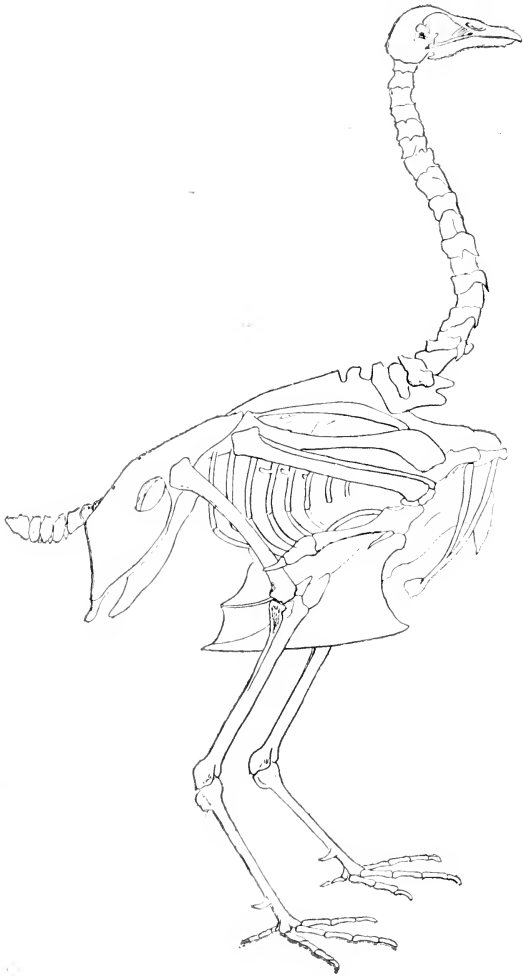

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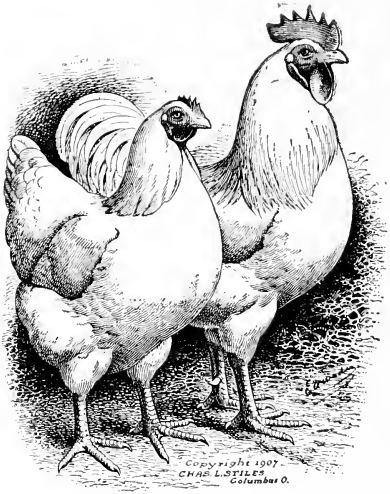
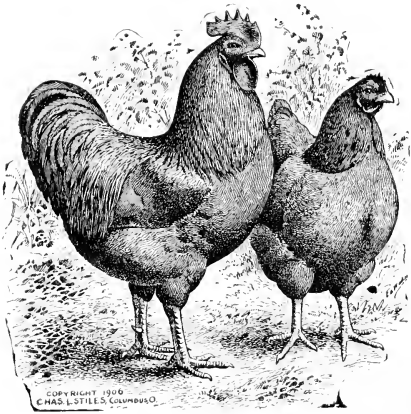
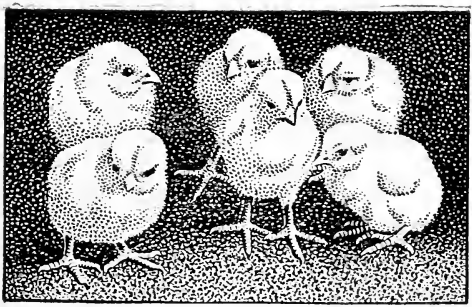


White Plymouth Rocks.



Buff Plymouth Rocks.



CHAPTER 1.

INTRODUCTION.

Causes of Diseases—Germs and Disinfectants—Requirements Essential to health—Hospital.

IT is said, "If we had a perfect knowledge of the laws of life and applied this knowledge in a perfect system of hygienic rules, disease would be impossible." In order to apply this to fowls it is very necessary to have some conception of the cause and nature of the several diseases, as well as of the best methods of assisting nature in overcoming them. The condition of the fowl in its natural state should be considered, and the food should be of such a variety as to imitate nature as much as possible; this is especially

essential where fowls are kept in confinement, and in attempting this, meat should be supplied, since, in the natural state, insects, worms, etc., are eaten in abundance.

Grit, in form of gravel, broken stone or even dishes, oyster shells, old plaster, etc., must also be supplied. Why? Because such are used as millstones or grinders between the strong, muscular walls of the stomach, and render the food capable of being digested and assimilated. Green food, as well as a variety of grains, are also essential.

Medicine is usually administered in the food or drinking water, but may occasionally be made into a ball or pill and introduced back into the throat, or it may be given in a small amount of water, poured slowly out of a spoon or small bottle.

Medicine is usually prescribed in grains, drops, drams or ounces, and, occasionally, pounds.

Approximately, a grain of powdered drugs equals about a large grain of wheat; a dram, a level teaspoonful, while a tablespoonful equals one-half ounce. This, however, varies considerably, as such drugs as sulphate of iron are very heavy, while others, as powdered quassia or quinine are light.

CAUSES OF DISEASES.

The first essential step in treating disease is to seek and remove the cause. In order to do this it is necessary to understand something about the common causes of disease.

If there is any disorder of the organs of digestion, the nature of the food, the amount given, etc., must be looked into; whether grit is supplied and whether the fowls have sufficient exercise.

If the respiratory organs are the seat of trouble, investigation must be made as to ventilation, whether sufficient, or whether not in such a way that the fowls are in a direct draught, and whether the floor is not damp or whether there is no draught along the floor.

If there is a general outbreak of some infectious disease, such as cholera, roup, etc., the general sanitary conditions must be looked after.

Lice so debilitate fowls that they may be regarded as an indirect cause of a great many diseases. Allowing fowls to become too fat will cause such troubles as apoplexy, congestion of the liver, diseases of the ovaries, inability to walk, etc.

GERMS AND DISINFECTANTS.

Since science proves that a great many diseases are due to germs, disinfectants must be understood and used.

The principal factors in developing germs are filth and moisture, with the proper temperature. They do not develop well in too high or too low temperature, such as below 70 or above 110 degrees Fahr.

Sunlight is a most excellent germ destroyer, and it is therefore very essential to admit plenty of this in poultry houses.

There are a number of good disinfectants; one among the best for the poultry raiser is carbolic acid,

one pound dissolved in three gallons of water. This makes an excellent solution for spraying the inside of hen houses, washing the roosts, floors, etc.

This strength mixed with lime makes an excellent white-wash.

For fumigating, sulphur burned in a tightly closed house is very cheap and effectual; this must be done while the fowls are out.

To get the best results from sulphur fumes, steam should be combined with the fumes. This can be done by setting a vessel in the room, containing boiling or steaming water, or, better still, have a vessel containing water boiling over a large lamp or small oil stove.

A cheap disinfectant for yards is sprinkling occasionally with air-slacked lime.

REQUIREMENTS ESSENTIAL TO HEALTH.

Conditions for the maintainance of health are very necessary, because it is far better to maintain, than to rely upon measures to regain, health.

A fowl is a machine of much higher tension than such animals as the horse or ox. This is readily seen when the fact is taken into consideration that the fowl breathes more rapidly, has more rapid circulation and higher temperature (normal 107 to 109 degrees), and digests more food in proportion to its weight; therefore proper care is all the more essential.

In the first place, the location for the poultry house and runs should be high and where there is good drainage. A sight that slopes east, south or south-east

is best. A spring or small stream of water at the foot of the incline makes a very desirable place.

The house should be roomy and, if possible, should face the south and be provided with large windows. Ventilation should be provided but direct draughts must be avoided.

The food must be wholesome, not mouldy, and of sufficient variety; and last, but not least important, strict cleanliness must be observed about the poultry premises.

HOSPITAL.

No poultry raiser should be without a hospital, or place where sick fowls can be properly cared for and treated. Such a place should be away from any annoyance, as cats, dogs or even other fowls, and should be arranged so that the patient can be kept comfortably warm or cool as the season may require, and should be dry, light and well ventilated, but draughts must be avoided. Frequent disinfecting and white washing and strict cleanliness are very essential in a place of this kind.

CHAPTER 2.

Diseases of the Respiratory Organs.

Simple Catarrh or Cold—Roup and Diphtheria—Laryngitis—Bronchitis—Congestion and Inflammation of the Lungs or Pneumonia—Gapes—Food Lodged in the Trachea or Windpipe—Air Sack Mites or Pneumomycoses.

SIMPLE CATARRH OR COLD.

THIS is a non-contagious catarrhal affection of the mucous membranes of the respiratory organs and eyes, and is the result of exposure to cold, especially to cold draughts over the roosts or along the floor of the hen house; poorly ventilated and damp hen house, and overcrowding, are also very fruitful causes.

SYMPTOMS: Watery eyes and sneezing, which is best noticed when one goes into the hen house quietly, in the evening; the fowl will become dull and feathers become rough; breathing is somewhat interfered with because of the nostrils becoming obstructed; the eyelids become swollen and sometimes stick together with the viscid secretion; breathing may be

carried on through the mouth only, which often becomes almost impossible because of the cheesy material gathering in the throat, in which condition the fowl soon becomes exhausted and dies.

TREATMENT: The cause must be sought and removed. The hen house must be clean, dry, well ventilated and lighted, but draughts along the floor and over the roosts must be avoided. The fowls must not be crowded nor overheated in a close, warm house and then let out in the cold, frosty air, or storm.

Twice a day give in soft feed a teaspoonful of the following remedy for every 20 fowls:

Quinine	2 dr.
Golden Seal	2 dr.
Hyposulphite of soda	2 dr.
Ginger	4 dr.
Gentian	6 dr.

Wash the eyes, nostrils and throat twice a day with boracic acid solution, made by dissolving fifteen grains to the ounce of warm water. The cheesy matter must often be removed from the throat; for this a wire with both ends flattened and made blunt and bent in the shape of the letter U is very convenient.

Good results are obtained by spraying the fowls each evening, while on the roost, with coal oil. This can be done very nicely with one of those sprayers that are used to spray potato vines or rose bushes, or with anything that will throw a fine mist or vapor. By spraying it over them while on the roost they will inhale the small particles of coal oil in the very min-

ute air passages, which acts as an antiseptic and is perfectly harmless.

ROUP AND DIPHTHERIA.

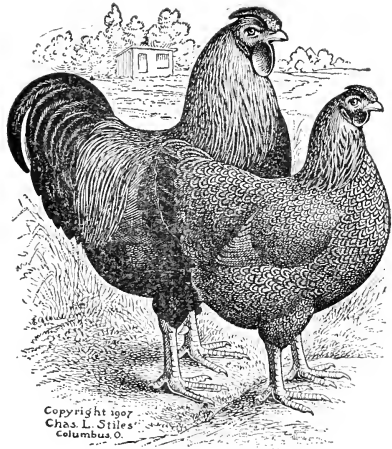
Roup and diphtheria were by some of the older writers treated as two different diseases, but here they will be classed under the same head.

It is an infectious, catarrhal condition of the mucous membranes of the throat, nose, eyes, sinuses (cavities in the head), etc.

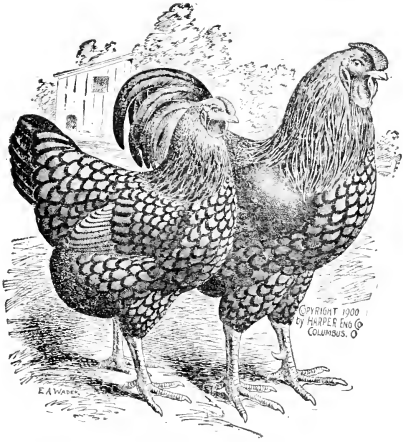
SYMPTOMS: The onset of roup is very similar to cold and simple catarrh, such as sneezing, watery eyes, dull appearance and difficult breathing, as they often breathe with the mouth open; in fact, the symptoms all along are very similar, except that simple catarrh will generally affect only here and there a fowl, and the outbreak will soon cease when the cause is sought and removed and such treatment given as directed.

But roup will go from bad to worse and spread through the flock very rapidly before active measures are taken to check it.

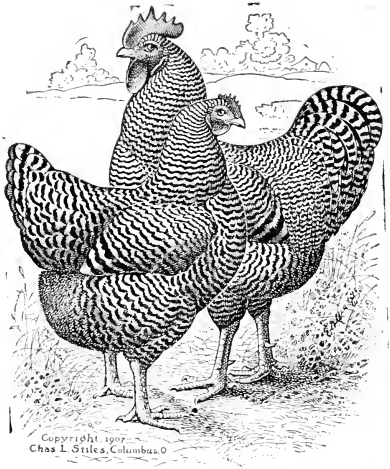
The most characteristic symptoms are, therefore, discharge from the eyes and nostrils; swelling or bulging out of the eyes, often to an enormous size; diphtheretic membrane forming in the throat, which often has a very offensive odor; there is great prostration, the feathers are rough, the appetite poor, comb and wattles dark and frequently the fowls drop dead from the roost, probably from suffocation. There



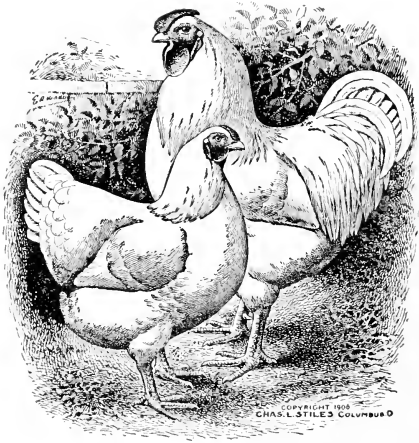
Partridge Wyandottes.



Golden Wyandottes.



Barred Plymouth Rocks.



White Wyandottes.

may be a diarrhœa, and where a number are affected the sight is a very pitiful one.

CAUSES: The cause of roup and diphtheria is a specific germ or bacteria; it is not yet positively decided whether it is the same germ that causes human diphthea, but it seems the best evidence points that it is not; however, it is always well to take some precaution.

Overcrowding in filthy, dark, damp, illy-ventilated poultry houses favors the development of the disease.

PREVENTION: Birds which have been at poultry shows, or newly bought birds, should be kept by themselves, away from the healthy fowls for a period of 20 to 30 days, in which time the disease would develop if they were affected.

The discharges from diseased fowls are loaded with germs which dry and become disseminated through the air and dust and are breathed into the air passages of healthy birds. Fowls which have recovered from roup should not be kept for breeding purposes, because their progeny are often weak.

TREATMENT: In the first place, the healthy birds should be removed to a non-infected place where the sanitary conditions are good. Poultry, animals, or persons should not go direct from infected pens to a healthy flock. Thorough and persistent disinfecting of the poultry houses, roosts, feeding troughs, drinking vessels, etc., is absolutely necessary both where sick and well are kept. (See article on germs and disinfectants, page 9).

To the healthy give a teaspoonful of the following tonic for each 20 fowls, once a day, in soft feed:

Quinine.....2 dr.
Sulphur..... 2 dr.
Hyposulphite of soda.... 2 dr.
Ginger..... 4 dr.
Gentian..... 6 dr.

The sick should be put in a warm, dry, clean, well ventilated place, which is free from draughts. The diphtheretic membrane should be removed from the throat as directed for removing cheesy material in simple catarrh (see page 13); then, at least once a day, wash the mouth, throat and eyes, if affected, with boracic acid solution, ten grains to the ounce of warm water, or with a 2% solution of creolin; or, perhaps, the best that can be used is equal parts of peroxide of hydrogen and clean, soft water. If pus and growths containing cheesy matter form about the head, these should be opened with a sharp knife and the wound kept filled with iodoform or boracic acid.

For internal treatment, give one grain of equal parts of quinine and calcium sulphide three times a day. To give this, it may be mixed with a little moist meal and made into a pill and pushed back into the throat.

When on a fair way to recovery, the tonic given above for the well may be given the same as directed, in their feed. Good, wholesome food should be given. All dead birds must be deeply buried or burned.

LARYNGITIS.

Laryngitis is an inflammation of the upper part of the windpipe.

CAUSE is usually exposure to cold, or cold rains, etc.

SYMPTOMS: Breathing is rapid and rasping, the neck is extended, the mouth open, there is a cough and rattling in the throat; by opening the mouth the larynx can be seen, which will appear fiery red, the bird will become listless and cease eating, and the comb may appear blue.

TREATMENT: Remove the cause by avoiding exposure. The bird should be placed in a warm, dry, well ventilated room and should be made to inhale steam a few minutes several times a day. This can be done by putting the patient in a closed box, in which a vessel containing a quart of oats is placed and over this pour hot water to which a little tar or camphor is added.

For internal treatment add two teaspoonfuls of sweet spirits of nitre and 10 drops of tincture aconite to one-half pint of water and give a teaspoonful every three hours for a day; follow by giving a grain or two of muriate of ammonia dissolved in a teaspoonful of warm water, three times a day.

Apply coal oil under the throat once a day. Feed sloppy food, milk, beef tea, etc.

BRONCHITIS.

Bronchitis is an inflammation of the mucous membrane lining the windpipe and bronchial tubes. It may be an extension of a catarrhal condition from the head or larynx.

CAUSES: The causes are similar to those of laryngitis, such as exposure to cold, wet, draughts, etc.; or it may be caused by compelling fowls to inhale irri tants; especially is dense smoke harmful.

SYMPTOMS: Breathing is rapid, there is a harsh, whistling sound and cough in the first stages, followed by loose rattling sounds made by the air passing through the mucus in the tubes.

The bird seems feverish and becomes weak, the feathers are ruffled and in severe cases breathing becomes very difficult; the patient frequently opens its beak in order to get sufficient fresh air. In such aggravated form the fowl soon becomes exhausted and will die if not quickly relieved.

TREATMENT: The cause must be sought and removed and the general surroundings should be the same as directed for laryngitis. Also give the fever medicine (aconite and sweet spirits of niter) for a day or two as directed on page 17.

Give soft, light food, such as stale bread soaked in milk, bran mash, boiled rice, etc. Follow the fever medicine by giving 10 to 20 drops of the following, four times a day:

Muriate of Ammonia...10 gr.
Syrup of Tolu.....½ oz.
Fluid extract of licorice ½ oz.

Steaming as directed for laryngitis is also necessary.

CONGESTION AND INFLAMMATION OF THE LUNGS, OR PNEUMONIA.

Congestion is an engorgement of the blood vessels in the lungs and is simply the first stage of inflammation.

CAUSES are exposure to cold, wet, etc., and in the inflammatory stage, or pneumonia, there is supposed to be a specific germ which acts as a potent factor.

Molting fowls are very subject to any of these inflammatory diseases of the respiratory organs because their skin is very sensitive and not protected wth feathers.

SYMPTOMS: The bird will breathe rapidly and with difficulty, and extend the neck with mouth open· the comb turns dark red or black because of the blood not being properly aerated; the feathers are ruffled, the patient rapidly becomes indifferent and may die, or the trouble may become lingering, in which condition there is usually a collection of yellow, cheesy material in the air sacks about the lungs, and after this condition takes place the fowl will appear brighter and perhaps begin eating, but the difficult breathing will continue, from which it will never fully recover.

TREATMENT: As soon as the first symptoms are noticed, place the bird in a warm, but well ventilated room, as plenty of fresh air is necessary. Give the fever treatment (aconite and sweet spirits of niter) given for laryngitis on page 17, for a day; follow by dropping ten drops of tincture digitalis in a tablespoonful of water and give ten drops of this solution and a grain of quinine every four hours.

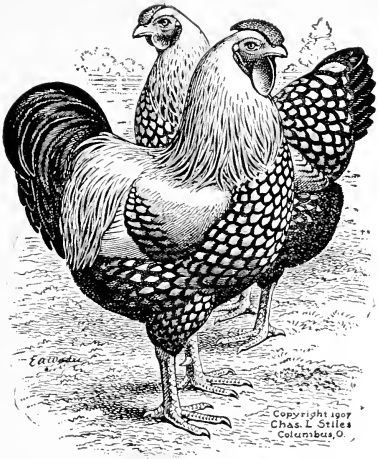
GAPES.

Gapes is a bronchial affection in young fowls. It is not well understood by many poultry raisers and is a trouble that causes great losses.

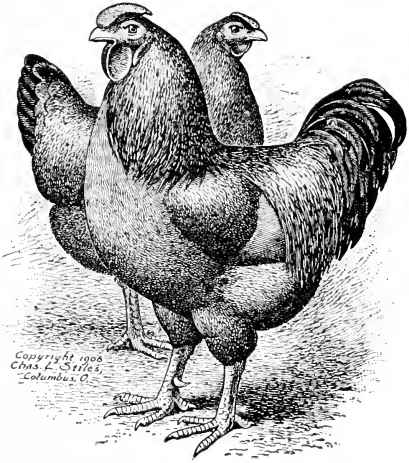
CAUSE: The real cause of this annoying trouble is small worms in the air passages. There are two kinds. The one most common and the one that affects chickens, turkeys, pheasants, etc. is known as "Sclerostoma Syngamus" or "Syngamus Trachealis."

The worm appears forked and really is two worms as the male and female are at this period always together, which the word syngamus, (meaning marriage) implies. The larger being the female and the smaller branch or fork the male; therefore the female is about three times as long and twice as thick as the male,

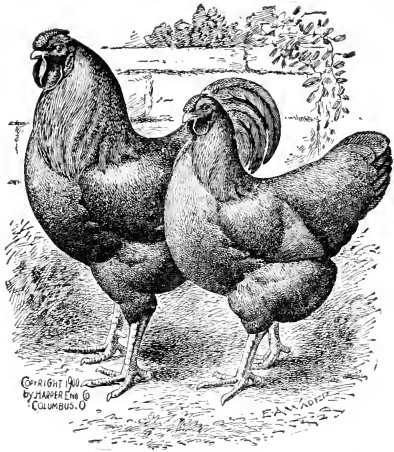
These worms are provided with mouths or suckers with which they attach themselves to the mucous membrane of the windpipe. The female is loaded with eggs which escape only after her death, usually when coughed out, and are deposited in the earth and are again taken up by another fowl or by earth worms, beetles, etc., and these, containing the eggs, are eaten by the bird in whose stomach the envelopes become digested and the embryo or young gape worm set free, which is supposed to bore its way through the walls of the digestive organs and the air sacks (the latter communicating with the lungs) and from thence into the air passages. At this stage or when entering the lungs, the sexes unite, at which time they are of



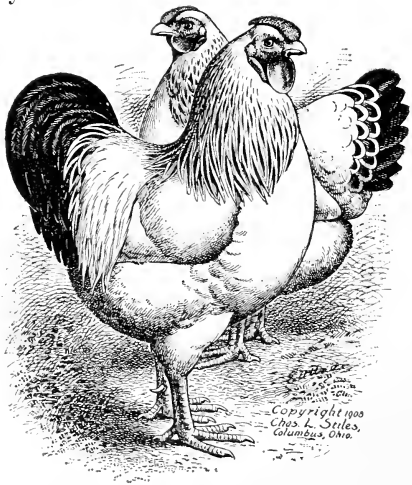
Silver Laced Wyandottes.



Rose Comb Rhode Island Reds.



Buff Wyandottes.



Columbian Wyandottes.

the same size, but the female soon becomes the larger because of being loaded with eggs.

The other kind spoken of above is known as "Syngamus bronchialis"; this, however, is not at all common and is supposed to affect water fowls,

SYMPTOMS: These are so familiar with the poultry-raiser that giving them would scarcely seem necessary except for the inexperienced.

The chick will be seen opening its mouth and gasping for breath frequently; it will sneeze and attempt to swallow; there may be a cough and, by watching closely, it is possible to see the worm being coughed up; the patient will appear dull, with drooping wings but the appetite is often not impaired.

By holding the chick toward the sun the worms may be seen in the windpipe.

TREATMENT: This, in the first place, should be preventive. Chicks kept on old runs that are polluted with eggs of gape worms are certain to have gapes; therefore, avoid this cause as much as possible.

Chicks kept on board or cement floors, until well feathered, are very seldom affected unless they are fed earth worms, or ground contaminated with gape worm eggs is thrown to them; neither should their drinking water be taken from pools draining polluted grounds or any place where contamination might be possible.

The old way of extracting the worm with a stiff horse hair, doubled upon itself so as to form a loop by

twisting, or a feather stripped all but a tuft at the end is yet one of the most successful ways of removal. Either of these is passed well down into the windpipe, twisted several times and then withdrawn.

Good results are sometimes obtained by dipping the feather in tobacco solution, turpentine, spirits of camphor; salicylic acid, ten grains dissolved in an ounce of water; or a weak, warm, salt solution may be dropped into the windpipe once a day; a small dropper should be used.

Garlic, onions or asafœtida given with the food or drinking water is considered valuable. Turpentine smeared on the underside of the neck and breast does some good. Professor Law says, "tobacco smoke may be blown under the cloth covering the birds until they fall over inanimate, when the cloth is removed and they revive in the open air."

Poultry yards which are known to be polluted with gapes should be covered thickly with salt and lime, which will destroy the worms and eggs.

By taking all the precautions laid down in this article, gapes can be prevented in a measure, at least, which is far better than curative treatment which is very tedious and often unsatisfactory.

Fumigating with carbolic acid is very good. To do this take a box three feet long, put in a partition of lath or wire netting, place the chicks in one end and a hot brick or live coals in the other, on which pour carbolic acid at intervals. Keep the box covered as tight

as it is safe to do without suffocating the patients; this should be repeated daily as long as necessary.

FOOD LODGED IN THE TRACHEA OR WINDPIPE.

Particles of food may accidentally be drawn into the windpipe (trachea) and will usually pass down until they reach the place where the trachea divides to pass into each lung; the voice or crowing organs are located at this point, hence a very characteristic symptom is a shrill or crowing noise. Other symptoms are such as difficult breathing and the comb turning blue suddenly.

TREATMENT is hopeless unless the foreign body is lodged well up in the windpipe, when it may be worked up by pressing and rubbing upwards with the thumb and finger; or if this fails, a small opening may be cut into the trachea directly on the obstruction, which should again be closed nicely with a few very fine silk stitches, and the wound kept covered with boracic acid or soda until healed.

AIR SACK MITES OR PNEUMOMYCOSES.

This is a mite or parasite, "Cytodites nudus", found in the air sacks about the lungs and sometimes inside of the bones, as in fowls there is communication between the air sacks and bones.

These mites may be likened unto Mange parasites and if they are found, upon examination, they will appear to the naked eye in the form of small white or yellow nodules.

CAUSES: The parasites are supposed to form in a mould growing on dead organic matter and are either

taken with the food and water or are inhaled in the form of dust.

SYMPTOMS in the early stages are not noticeable and at the best are very unreliable. About the first that will be noticed is drowsiness and weakness; the bird will not follow the flock; breathing will become difficult; the patient may utter cries, especially during expiration, but the throat, upon examination will be found healthy; great thirst and often little or no appetite; there is rapid emaciation; a fetid diarrhœa may set in and prove fatal in from one to six or eight weeks.

TREATMENT must be principally fumigating and hygienic, although internal remedies are also indicated. The affected birds should be removed from the flock.

Tar fumes are especially valuable, or turpentine poured on a hot brick will be found a good way to fumigate. Care must be taken that the fumes are not sufficiently strong to cause suffocation.

For internal treatment give five or ten grains each of sulphur and hyposulphite of soda, once a day; the food must be wholesome and nutritious. The walls of the hen house should be whitewashed; the roosts and floors washed with a 5% solution of carbolic acid, or with Chloro-naptholeum or some such preparation; the runs should be frequently sprinkled with lime. Convalescing fowls should not be returned to the main flock too soon.

CHAPTER 3.

Diseases of the Digestive Organs.

Catarrhal Stomatitis, Sore Mouth or Pip—Obstruction in the Throat—Impaction of the Crop, Crop-bound, or Paralysis of the Crop—Catarrh, or Inflammation of the Crop—Indigestion or Gastritis—Gastro-Intestinal Catarrh, Bowel Trouble in Chicks—Simple Diarrhoea—Enteritis, Inflammation of the Bowels—Constipation—Congestion of the Liver—Inflammation of the Liver, Hepatitis—Infectious Entero-Hepatitis or Black Head in Turkeys—Cholera—Worms—Asthenia, Going Light—Peritonitis and Abdominal Dropsy—Limber Neck, Ptomaine Poison.

CATARRHAL stomatitis is a catarrhal inflammation of the mouth; the disease is oten called pip.

Dr. Salmon says: "The term pip is commonly used with birds much as hollow-horn and murrain are applied to cattle diseases," and most everybody nowadays knows that those are only imaginary diseases, or symptoms of some other trouble in cattle.

CAUSES. Sore mouth is often associated with catarrh and roup, but it is very frequently a local trouble caused by the bird taking some irritant, or by exposure to dampness and filth; especially is gas arising from decomposed hen manure in an illy-ventilated hen-house a fruitful cause. Injuries, suffcient to produce inflammation, may be mentioned as another cause.

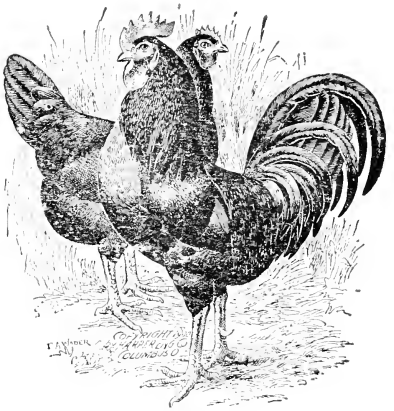
SYMPTOMS: These consist of the beak being held open and a false membrane or horny substance accumulating on the tongue and in the corners of the mouth; there may be a cough of a croupy nature; the fowl occasionally jerks its head and may emit a shrill sound.

TREATMENT: The false membrane should be removed, if this can be done without causing too much pain, and the parts washed with a solution of borax, one dram to four ounces of water; or a five per cent solution of chlorate of potash, or if removing the membrane is very difficult and painful, apply with a brush a solution made by dissolving a little hyposulphite of soda in glycerine.

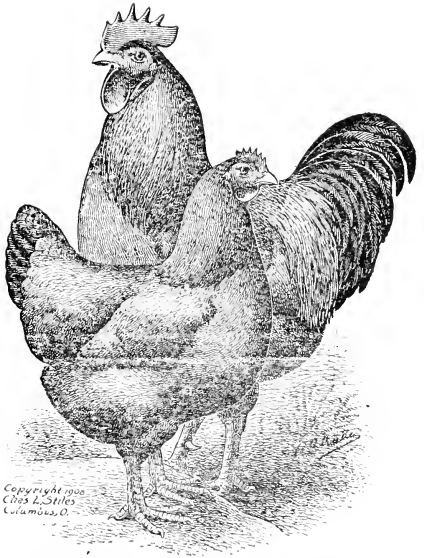
OBSTRUCTION IN THE THROAT.

This is a condition that occasionally happens when the bird attempts to swallow some large or irregular substance, such as a large bolus of food or a piece of green bone.

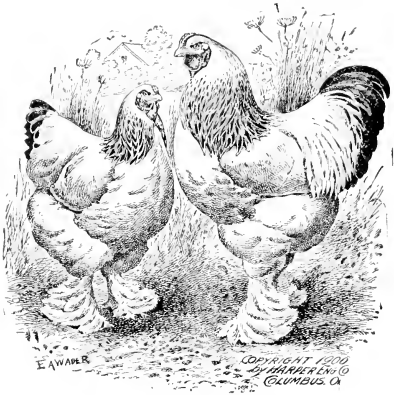
The trouble is characterized by the fowl attempting to rid itself of it, and if the substance is at all hard or firm it can be felt by placing the finger and thumb along each side of the throat.



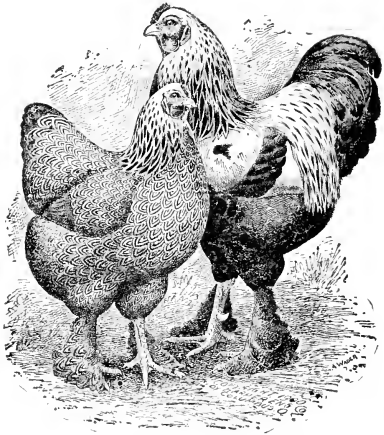
Black Javas.



Single Comb Rhode Island Reds.



Light Brahmas.



Dark Brahmas.

Relief must be given as quickly as possible, as there is danger of suffocation.

This can often be accomplished by manipulating the sides of the the throat carefully in such a manner as to work the obstruction upward into the mouth. This can be facilitated by pouring a little sweet oil into the throat. Occasionally it may be necessary to use blunt forceps.

IMPACTION OF THE CROP—CROP BOUND OR PARALYSIS OF THE CROP.

This is a condition in which the walls of the crop become partially paralyzed because of the organ being distended with coarse, bulky or indigestible food, or it may be brought about by depriving the bird of food for a considerable length of time, and then allowing all it can eat.

Still another cause is "Aberration of the Appetite" which means an abnormal appetite, in which case the fowl will seek indigestible food, such as leaves, straw, etc., or at times it will eat very little; then again will eat large quantities of food which, by being retained, ferments and greatly aggravates matters.

SYMPTOMS: The patient appears dull and its movements are sluggish; the crop is fnll, sometimes distended to an enormous size and will feel more or less hard, and when fermentation of the contents has taken place a sour liquid may escape from the mouth, especially when the bird is held with the head down; the comb becomes pale or dark and if relief is not af-

forded the fowl may die, or gangrene of the crop may be the result.

TREATMENT: One or two teaspoonfuls of castor oil, or, if this is not at hand, two tablespoonfuls of warm water should be given at once; then the crop should be carefully kneaded with the thumb and finger in such a manner as to press the contents toward the mouth; the head must be suspended frequently to allow the food to drop from the mouth.

By being persistent this method usually is successful; if not, or if the contents are hard or irregular, as pieces of bone, etc., an opening must be made into the crop which should not be more than one-half to one inch in length. Before making the incision the feathers should be removed; then with a clean sharp knife it should be made rather high on the crop and the mass removed carefully: then wash the wound with warm water in which a little soda has been dissolved and stitch the edges together nicely with silk; give the bird no food for 24 hours, after which feed lightly with milk and soft feed. Give three to five grains of bicarbonate of soda and a few drops of tincture gentian in the milk three times a day. The stitches should be removed in a week.

CATARRH, OR INFLAMMATION OF THE CROP.

Catarrh of the crop is a congestion or inflammation of the mucous lining of this organ and serious digestive troubles are the result.

CAUSES: These can usually be attributed to feeding unwholesome food, irregular feeding or overfeeding, or it may be the result of the bird eating some irritant or poison, or it may follow impaction of the crop; still another cause is the presence of small worms which infest the crop, oesophagus and gizzard.

SYMPTOMS: These somewhat resemble symptoms of impaction, but in catarrh the distended crop will feel soft and will be found to contain liquid and gas, with some food, and the odor from the bird's mouth, when pressing on the crop, will be sour and offensive.

TREATMENT: Empty the crop at once by careful pressure and manipulating the contents toward the mouth while the fowl is held with the head down; then place the patient in a clean, dry, comfortable coop, and twice a day give five grains of bicarbonate of soda, two grains of subnitrate of bismuth and a few drops of tincture gentian.

Food should be with-held for a day or so; then feed light diet, such as boiled rice, beef broth, etc.

For symptoms and treatment for worms see article on those parasites.

INDIGESTION OR GASTRITIS.

The digestion of the fowl is rather complicated and any interference with its proper function often gives serious troubles.

Just below the crop, or between the crop and the gizzard, is a small pouch or dilated portion of the oesophagus called the proventriculus, in which the

glands that secrete gastric juice, are situated and the food by passing slowly through this pouch, or true stomach, becomes mixed with the necessary digestive ferments or juice; hence, any interference with the food passing through the proventriculus, either from disorder of the crop or the gizzard or by soured food irritating the organ and interfering with the normal flow of the digestive juice will result in indigestion.

CAUSES: These are numerous; anything that interferes with the proper functions of the digestive organs will bring about indigestion, such as not allowing a sufficient amount of grit, over feeding, long continued use of stimulants, as pepper, or very rich food and lack of exercise, and I believe one of the most frequent causes is the bird eating soured food, which is often the case when soft food is fed during the summer and some allowed to remain in the feed troughs for some time.

Drinking impure water or eating poisons, such as rat poison; or occasionally a fowl will swallow some sharp object, as a pin or a sharp piece of bone which may lodge in the proventriculus.

SYMPTOMS: The fowl will appear dull and drowsy; there will be very little or no appetite; some of the food will usually remain in the crop, which will feel doughy and soon become sour; the fowl will usually linger along for several days, or occasionally the trouble becomes somewhat chronic and diarrhœa sets in if not relieved, while others live but a short time.

TREATMENT: Put the bird in a comfortable place by itself, give one or two teaspoonfuls of castor oil, follow in several hours by giving a teaspoonful of the following three or four times a day:

Ingluvin.....20 grains.
Tr. Nux Vomica.....10 drops.
Dil. Hydrochloric Acid 5 drops.
Water.....2 oz.

Feed light diet as recommended for catarrh of the crop.

GASTRO-INTESTINAL CATARRH—BOWEL TROUBLE IN CHICKS.

This is a catarrhal condition or an inflammation of the mucous lining of the whole digestive tract. It is the condition known by the name "bowel trouble" in young chicks which perhaps causes greater loss of chicks, a few weeks old, than any other disease. However, older fowls are not exempt and in these it is often mistaken for cholera which disease it somewhat resembles but does not prove so rapidly fatal.

CAUSES: It can usually be attributed to errors in feeding or poor management and bad sanitary conditions, such as overfeeding or heavy feeding after letting the chicks become very hungry, or by feeding too freequently, or by feeding very rich and stimulating, or tainted, or soured or mouldy food, or allowing fowls to drink bad, filthy water. Then, there are other causes, such as being chilled on cold floors, or exposure to dampness or cold; especially is this the case in young

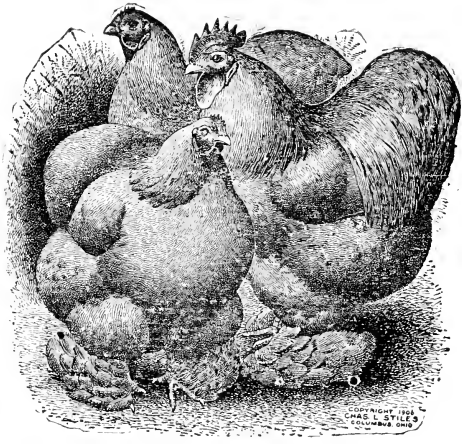
chicks; often brooder chicks are overcrowded and overheated, which reduces the vitality, and when let out in the open air they become chilled and bowel trouble is the result.

In old fowls, exposure to draughts, cold rains, etc., during molting time, may be followed by an attack of gastro-intestinal catarrh.

Going back again to the causes that may produce the trouble in young chicks; over-heating in the incubator or feeding while too young are often the very start of bowel diseases because of the debilitating effects on the chicks' system.

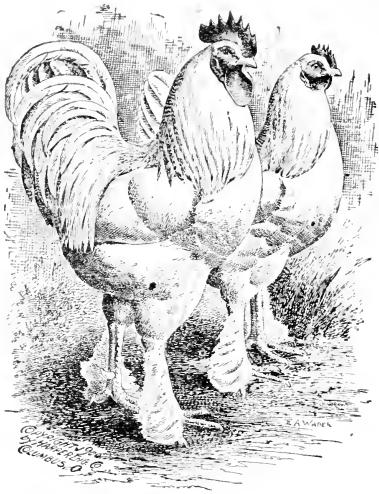
SYMPTOMS: There is usually great thirst, loss of appetite, food often remains in the crop; the bird is dull, with wings hanging down; the droppings are thin and of a whitish or sometimes of a yellowish or greenish color, and seem to be of a sticky nature, especially in young chicks, when a mass of excrement will often accumulate about the anus, and when they are kept in a brooder this will dry on and sometimes totally obstruct the cloaca. There are usually frequent attempts to expel the excrement, which are often accompanied with pain and much straining. The trouble may soon terminate in death or it may terminate in a severe diarrhoea or inflammation of the bowels.

TREATMENT: In the first place the cause must be sought and removed; then, in young chicks, a grain each of bicarbonate of soda and subnitrate of bismuth, and a drop of tincture gentian given three or

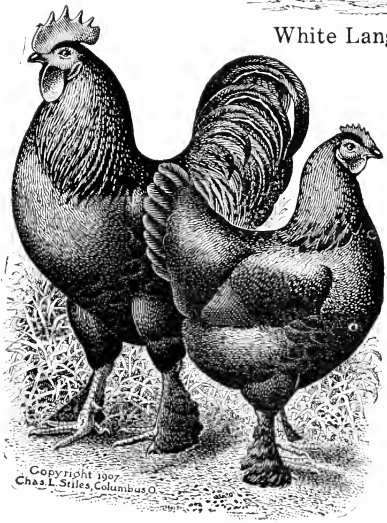


Buff Cochins.

White Cochins.



White Langshans.



Black Langshans.

four times a day proves very successful. Boiled milk and lime water, equal parts, or weak store tea given to drink for a few days is sometimes all the treatment necessary; of course, whatever the treatment given, the feeding must be carefully regulated; boiled rice and oatmeal are good light diet, or, for chicks, there is nothing better than very hard, dry, toasted bread.

Another very good treatment is to give one or two drops of castor oil, followed by a grain of equal parts of bicarbonate of soda and powdered rhubarb given three times a day to each chick. Never attempt treatment until the cause is removed.

Treatment for old fowls differs only in that the doses should be larger and, when due to their eating something unwholesome, a teaspoonful of castor oil may be given before the other medicine, to cleanse the digestive tract.

A dram of sulphate of iron dissolved in each quart of drinking water once a day often works very nicely when there are only mild attacks and where a large flock of chicks are to be treated.

SIMPLE DIARRHŒA.

Diarrhœa is usually a symptom of some other trouble or it may be due to the fowls eating something that will act as a purge.

It is characterized by a very watery evacuation of the bowels, often without any other apparent ill condition of the bird, unless it is the symptom of some

other trouble, in which case the existing disease must be treated accordingly.

TREATMENT: Seek the cause and remove it if possible; then make a tea of white oak bark or blackberry roots and give to drink, or moisten a feed of ground oats or corn meal with the tea; or, in very obstinate cases, from one to five drops of laudanum may be given several times a day as long as necessary.

ENTERITIS—INFLAMMATION OF THE BOWELS.

Enteritis is an inflammation principally of the mucous membrane lining the intestines, but in advanced cases the muscular coats are also involved. All fowls are subject to this trouble but ducks are very susceptible.

CAUSE: In most cases the disease is caused by germs, of which there are a number of different kinds that are implicated in producing it; the germs are principally taken into the system with the food and water. Half-grown fowls or fowls that are in a debilitated condition succumb more readily.

Poisons or irritants taken into the digestive tract are also capable of producing enteritis; common salt, meat or fish brine, rat poison, Paris Green, paint, lye, etc., are the most common among these. I wish to state here that common salt is very injurious to poultry if given in excess, while a very small amount is essential.

SYMPTOMS: The fowl will appear dull and sleepy; there is great thirst, but very little or no appetite;

the feathers appear rough; the head, wings, and tail will droop; the discharge from the bowels is first a bluish green color, but later yellow and bloody, which is one diagnostic symptom and one which differs from cholera, which the disease somewhat resembles, but enteritis is confined mostly to a single flock and proves most disastrous to young or half grown birds, while cholera affects old and young, spreads very rapidly and proves fatal in a short time.

Those cases that are due to poisons or irritants will manifest practically the same symptoms, but as soon as the poison is removed the trouble will spread no further and will be confined to those only that had access to it.

PREVENTION and TREATMENT: Remove the sick from the flock, deeply bury or burn the dead; the house and runs must be kept scrupulously clean; the floors should occasionally be sprinkled with carbolic acid solution; the yards sprinkled with lime and the house fumigated with sulphur as directed in chapter on disinfecting.

Food and water should be pure and should be scalded or boiled. Those that require treatment should be put in a comfortable place away from the healthy and should be fed a light diet, such as boiled rice or stale bread soaked in milk; and give a grain each of naphthalin and quinine with a few grains of powdered charcoal two or three times a day; or a few grains of bicarbonate of soda and a grain each of Dover's Powders and salicylate of bismuth three or four times a day.

These drugs should be given in a little soft feed or out of a spoon, mixed with a little slippery elm or flaxseed water.

After the diarrhoea is checked and there are no more bloody evacuations, a few drops of tincture gentian should be given three times a day and a dram or two of sulphate of iron dissolved in each quart of drinking water.

When the trouble is due to poisons or irritants, the cause must be removed at once and demulcent drinks, such as flaxseed or slippery elm tea should be given with stimulants, such as coffee and a little brandy.

CONSTIPATION.

Constipation is dryness and accumulation of the contents of the intestines and may lead to total obstruction of the bowels.

CAUSES: Constipation may be due to the bird eating dry astringent food, as broken acorns, cheese, etc., or it may follow diarrhoea or intestinal catarrh, because of the mucous lining of the intestines being irritated and therefore not secreting the normal amount of fluids, or, in those bowel disorders, the feathers often become so firmly matted together that the anus becomes obstructed and defecation becomes painful or impossible.

Accumulation of egg matter in the oviduct, from broken eggs, may also cause filling up of indigestible matter in the bowels by pressing upon and obstructing the cloaca.

SYMPTOMS are hard, dry droppings; the feathers about the anus may be matted, this, however, is usually the result of previous diarrhoea; there are frequent but ineffectual attempts to evacuate the bowels; the fowl will become dull, will stand with back arched, walk sluggishly and with drooped head; the hard mass or distended bowel may often be felt through the abdominal walls.

TREATMENT: In mild cases, laxatives, such as one or two teaspoonfuls of castor oil or ten to thirty grains of Epsom salts in a spoonful of warm water given occasionally is all that is necessary. In obstinate cases or where the bowel is obstructed mechanical means must be connected with the above treatment. In such cases the feathers must be clipped off, if any are matted about the anus. This is often best done by soaking the parts a while in warm water; then olive oil or warm soapy water should be injected into the cloaca with a small syringe, and in an hour the hard mass should be carefully manipulated and removed with the finger or some blunt instrument, such as the end of a teaspoon handle. If there should be a broken egg, treat accordingly.

The food should be soft and sloppy and green food should be provided; for this onions are especially valuable.

CONGESTION OF THE LIVER.

Congestion of the liver is an abnormal filling up with blood in this organ.

CAUSE is overfeeding, especially with very nutritious or stimulating food, such as too much corn, buckwheat, pepper, ginger, etc. Especially is this kind of feeding dangerous when fowls are closely confined. It is also associated with certain diseases, as cholera or diseases of the lungs and heart.

SYMPTOMS are seldom noticeable until the stage of inflammation takes place, but if any are noticed, they are such as irregularity of the bowels and appetite; the fowl will at times appear sleepy; the comb and wattles may become bluish, then yellow.

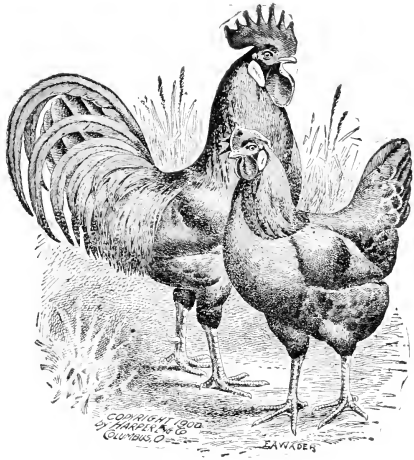
TREATMENT: Carefully regulate the diet and avoid such causes as mentioned above; give from ten to twenty grains of Epsom salts once a day for several days; compel the fowl to exercise by giving free range, or provide a scratching pen with chaff or leaves, and feed plenty of green vegetables.

INFLAMMATION OF THE LIVER—HEPATITIS.

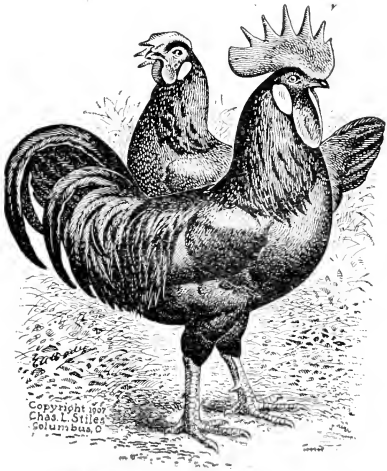
This disease is always preceded by congestion, therefore the causes are the same.

SYMPTOMS are sluggishness, loss of appetite, yellowishness of the comb, wattles and eyes; often there is a diarrhœa of a whitish watery nature and pressure on the abdomen shows tenderness and pain.

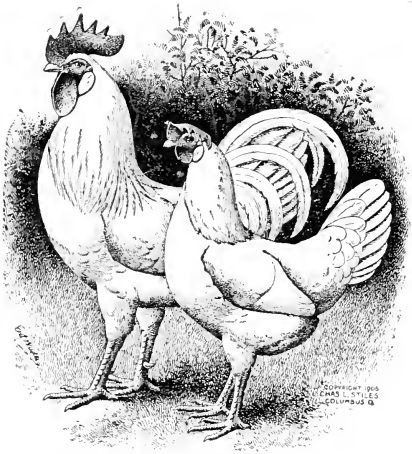
POST-MORTEM APPEARANCE: Upon examination the liver will be found enlarged and frequently there are yellow patches or abscesses seen over its surface; it is usually soft and easily torn.



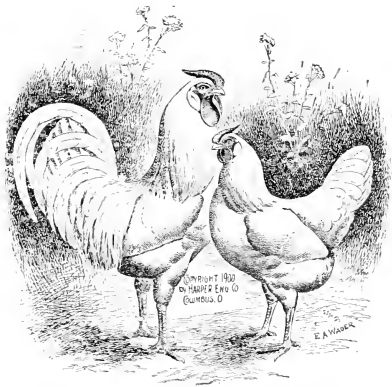
Single Comb Buff Leghorns.



Single Comb Black Minorcas.



Single Comb White Leghorns.



Rose Comb Whith Leghorns.

TREATMENT: Give Epsom salts in ten to thirty grains twice a day for two days, followed by giving two drops of dilute nitro-muriatic acid in a teaspoonful of water three times a day. Another excellent treatment is Podophyllin, one half-grain, and calomel one-fourth grain, twice a day for several days, followed with a few drops of fluid extract of hydrastis three times a day.

The diet should be the same as directed under congestion of the liver.

INFECTIOUS ENTERO-HEPATITIS OR BLACKHEAD IN TURKEYS.

This is an infectious disease in turkeys and is most destructive to the young or rather half grown (from four to five months old.)

It is due to the germ Amoeba Meleagridis entering the digestive tract with the food and water, affecting principally the liver and double bowel (caeca.)

CAUSE: As stated above, the direct cause is a germ and bad hygienic conditions, such as filthy feeding places or impure drinking water, greatly favor its propagation.

SYMPTOMS: These vary in different cases according to the intensity of the disease. Those most general are drooping of the head and wings, moping, loss of appetite; there is a yellowish or greenish diarrhoea which is one of the most marked symptoms; the head becomes dark or in some cases, nearly black, which gives the disease the common name "Black Head."

Another diagnostic symptom is the great prevalence of the disease, which shows that it is of an infectious nature. The post-mortem condition is also a useful guide; the liver will be inflamed and enlarged and deep-seated spots will appear which are of various colors, as brownish red, yellow, and pale or grayish dirty white. The caeca (double bowel) will be found greatly enlarged and the walls thickened; the contents are usually a pasty green substance, although in some instances the caeca will be plugged with a mass of broken down mucous or lining from the bowel.

TREATMENT is of the nature of intestinal antiseptics and tonics. Place the sick bird by itself and give one or two teaspoonfuls of castor oil; follow in a few hours by giving one or two grains each of quinine and salol three times a day; or, five grains of sulphur and one grain each of quinine and sulphate of iron three times a day.

But since treatment is almost useless, unless the source of infection is removed, preventive measures are absolutely necessary. The well should be removed to a non-infected place at once and should not be permitted to come in contact with the infected runs or sick fowls and should be fed through a slatted partition or in such a way that they can not carry infection on the food with their feet. The same precaution should be observed with the drinking water, which must be pure, and, of course, thorough disinfecting must be carried out by sprinkling the floors once a

week with a solution of carbolic acid; see germs and disinfectants, page 9.

All manure or droppings should be carefully removed each day and burned, as well as all dead turkeys. No turkeys that have been with the affected should be kept for breeding purposes but should be fattened and disposed of.

Eggs should be obtained from healthy stock and the young kept so far away from the old infected runs that they cannot come in contact with them, nor have access to drinking water that may drain the infected runs.

By taking all the precautions possible, in the way of preventing infection from the old runs and from exposed fowls, there is a fair possibility of eradicating the disease.

By leaving the old runs unoccupied for two years, turkeys can again be raised with comparative safety.

CHOLERA.

Cholera is an acute infectious disease and one of the most fatal with which poultry becomes afflicted. It affects all domestic fowls; even ducks are not free from it, and rabbits when exposed or inoculated with the germ become affected; the disease is so fatal that the per cent. of mortality reaches from 90 to 95.

CAUSES: The direct cause is a germ, "Bacterium cholera gallinaceae," usually taken into the system with the food and water, or it may be inhaled with

dust or inoculated through a wound. But there are many accessory causes that favor the propagating and disseminating of the germs, such as filth and overcrowding, fowls drinking filthy, stagnant water, allowing the droppings to accumulate, especially during hot weather. The disease may be contracted at poultry shows or fairs, where birds may become affected and carry the disease to poultry yards, or buzzards feeding on a fowl that has died from cholera may readily carry the infection for miles and contaminate poultry yards. Flies are capable of carrying the germ by flying from the decaying carcass of a fowl that has died from cholera, on the food of healthy fowls, or the food may become contaminated by fowls carrying the germ on their feet or bills. Men or animals may carry it with their shoes or feet.

SYMPTOMS: There is extreme dullness; ruffling of the feathers; the bird is seen off by itself with head and wings hanging to the ground and is apparently sleeping; comb and wattles are of violet color; no appetite, but great thirst. The crop is nearly always full, which, however, is a symptom of almost any digestive disorder and, alone, would not be considered a symptom of cholera. Often there is a frothy discharge from the mouth, a greenish diarrhoea will suddenly set in and the bird will in many cases die of convulsions.

The disease usually shows itself in from 18 to 48 hours after the germ has been taken into the system,

or after the fowl has been exposed, and lasts from one to three days.

The most reliable methods of diagnosing cholera are its rapid spreading through a flock, showing its highly contagious character; its being very fatal in a few days; the greenish diarrhoea; upon examining a dead fowl the internal organs are nearly all more or less involved; the liver, kidneys, heart and spleen are often found swollen, red or congested; the bowels show patches of congestion and inflammation and occasionally the lungs will be found engorged.

PREVENTION: Because of cholera being due to germs and therefore infectious, all efforts possible should be put forth to prevent its spreading, by such mediums as explained above, and where there is an outbreak the sick should be isolated from the well, the premises cleaned and disinfected at least twice a week by washing the floors and roosts with a carbolic acid solution, one pound dissolved in three gallons of hot water, and, if possible, the walls whitewashed. The droppings and dead birds should be burned daily. The drinking water should be previously boiled and given in vessels that are scalded and cleaned each day. Feeding and watering should be done through a slatted partition to prevent carrying infection on the food and water with their feet.

For those that are not yet afflicted, a teaspoonful of dilute sulphuric acid may be added to each quart of drinking water once a day.

TREATMENT for the sick is almost hopeless and I wish to caution the readers of this little book not to place too much confidence in treating the sick birds, but use all the precautions possible to prevent the spreading of the disease.

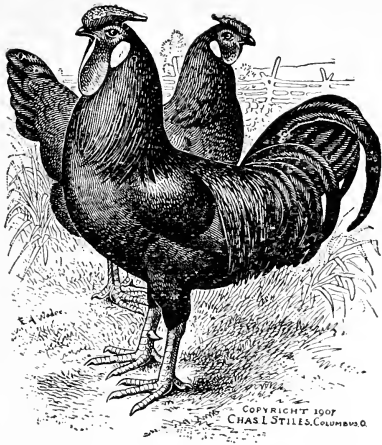
It is true there are many recommended cures, but the reader must bear in mind that a large number of supposed cases of cholera that have been cured were not cholera, but some other bowel trouble, such as intestinal catarrh, enteritis, ptomaine poison, etc., and in such cases treatment is not quite so hopeless; hence the good results in supposed cholera cures.

But if treatment is attempted, as is often desirable, especially for valuable fowls, the following is very much indicated: Mix 15 drops of carbolic acid in eight ounces of water and give a teaspoonful every four hours; also give one or two grains each of quinine and salicylate of soda and two drops of tincture opium in a spoonful of water three times a day.

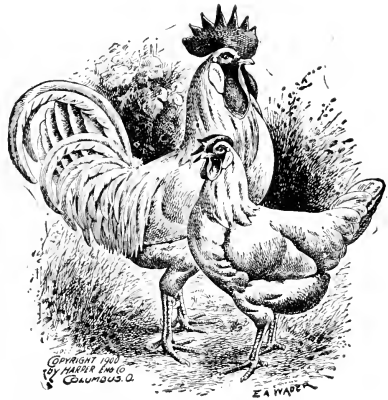
WORMS.

Fowls, like other domestic animals, frequently become infested with worms.

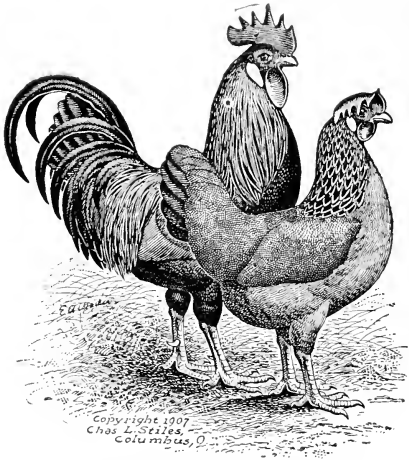
These parasites are found all through the digestive tract, principally in the intestines, but several small varities are found in the oesophagus, and the walls of the crop and gizzard. There are many varieties, but they can be classed under two heads, namely, round worms and tape worms.



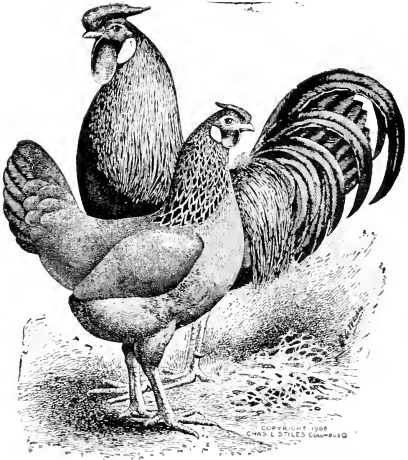
Rose Comb Black Minorcas.



Single Comb White Minorcas.



Single Comb Brown Leghorns.



Rose Comb Brown Leghorns.

SYMPTOMS: Same as in other animals; there is general unthriftiness, but positive diagnostic symptoms are not very characteristic, save one, which is the presence of worms, either in the droppings or as shown by post-mortem examination.

The most common symptoms are; the bird becomes poor and dull; has irregular appetite, sometimes ravenous, other times poor; often wanders off alone and stands or sits with its head under its wing, and frequently there is dizziness and diarrhoea. The feathers will soon appear rough.

TREATMENT: When it becomes evident that fowls are infested with worms they should be put on new runs, or the old runs cleaned and sprinkled with air-slacked lime and salt, and, if convenient, spaded or ploughed; feeding should be done on a clean place where there are no droppings.

For a vermicide, turpentine stands at the head. To administer it mix with equal parts of sweet oil and give one-half teaspoonful twice a day for several days, or until the bowels move freely; follow with tonics, such as one dram of sulphate of iron dissolved in each gallon of drinking water, once a day. For tape worms, powdered areca-nut or powdered male fern, given in grain doses in the evening, after fasting for ten hours, and followed the next morning with thirty grains of Epsom salts in a spoonful of water, is excellent treatment; feeding garlic or onions is also considered good.

ASTHENIA—GOING LIGHT.

This is a condition in fowls for which there are no particular symptoms except gradual and extreme loss in weight.

It is supposed to be due to a bacterium, causing a catarrhal condition of the duodenum (the first portion of the intestine, next the gizzard.) The disease is therefore infectious; it is chronic, usually ending in death in several months.

TREATMENT is first looking after the sanitary conditions as in all infectious diseases, and removal to new runs if possible.

Give one-fourth grain of calomel every four hours until the bowels move freely; follow by giving five or ten drops of elixir iron, quinine and strychnine, three times a day, with good nutritious food.

PERITONITIS AND ABDOMINAL DROPSY.

Peritonitis is inflammation of the delicate membrane which lines the abdominal cavity and covers the bowels and other organs in the abdomen.

CAUSES: It may be caused by direct injury, such as wounds through the walls into the abdomen, or some injury to the bowels causing perforation and letting the contents escape through, or it may be inflammation extending from other organs, as the liver, bowels, or even the egg organs or testicles; it often follows caponizing.

SYMPTOMS: There is evidence of great pain and uneasiness; the bird will appear hot or feverish, espec-

ially the abdomen, which is also painful upon pressure; the appetite is lost; the fowl becomes very weak; death may take place in a few days, or it may assume a chronic condition, in which stage a liquid will be thrown out from the inflamed membrane causing what is known as "Abdominal Dropsy," which is characterized by the abdomen's becoming enlarged and feeling soft like a water bottle.

TREATMENT is scarcely profitable, except in very mild cases; the bowels should be emptied at once by giving one or two teaspoonfuls of castor oil, then, if in the first stage, aconite may be given; put ten drops of tincture of aconite in a glass of water and give one-half teaspoonful every two hours for a day, followed by giving tincture digitalis prepared the same as aconite, for a few days. In cases where there is fluid in the abdominal cavity, tapping may be resorted to; this can be done by puncturing the lower part carefully with a small trochar or hollow needle, followed by giving one grain of iodide of potash in a teaspoonful of water, twice a day. The food should be laxative but nutritious.

LIMBER NECK—PTOMAINE POISON.

This is a disease which usually attacks fowls very suddenly and rapidly proves fatal.

CAUSE is supposed to be ptomaine poison, which enters the system by fowls eating maggots or decomposed meat, such as a carcass of another fowl or some other animal, or spoiled meat that has been

thrown out; also, maggots found in rotten manure may cause it, but, perhaps, are not so apt to as those gotten from rotten meat.

SYMPTOMS: The disease is sometimes so rapidly fatal that no symptoms are noticed before the death of the fowl, but where the illness lasts for one or two days there will be extreme prostration, the head and neck hanging limp (which gives it the name of "Limber Neck"); the wings of the fowl are drooped; frequently there is a diarrhoea; the feathers often become loose and drop out; the fowl may lie on its breast unable to rise, and occasionally flutter, or die without a struggle.

TREATMENT: The cause must be sought and removed. As a preventive for those that are not already afflicted, dissolve an ounce of hyposulphite of soda in each gallon of their drinking water, once a day. To the sick, one-half grain of calomel may be given every four hours, until three or four doses are given. Follow with a grain of quinine and one or two drops of tincture nux vomica given three times a day. Four or five drops of turpentine given in a teaspoonful of sweet milk, three or four times a day, is also said to be a speedy cure.

CHAPTER 4.

Diseases of the Heart.

Pericarditis—Rupture of the Heart.

PERICARDITIS.

THIS is an inflammation of the sack around the heart.

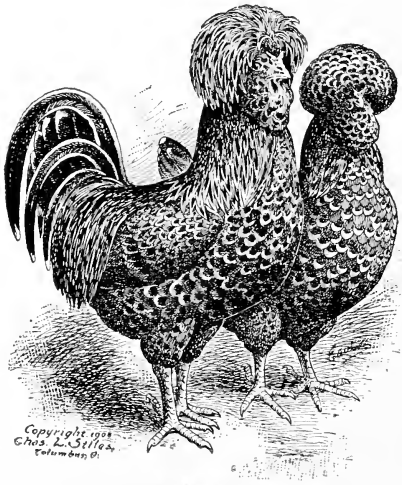
CAUSES: It frequently associates other diseases, such as diseases of the lungs, or it may be the result of exposure.

SYMPTOMS: The fowl will raise its head and breathe with difficulty, and, by placing the ear to the chest, a grating or splashing noise may be heard. Exertion will cause great exhaustion and sometimes sudden death.

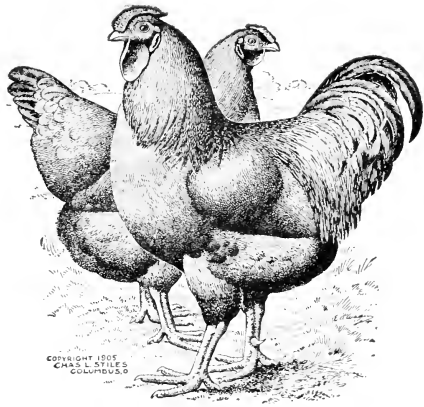
TREATMENT is very seldom attempted because the disease is usually unnoticed until after death; but, if noticed, five drops of sweet spirits of nitre may be given in a teaspoonful of water every four hours, and a drop of tincture digitalis twice a day.

RUPTURE OF THE HEART.

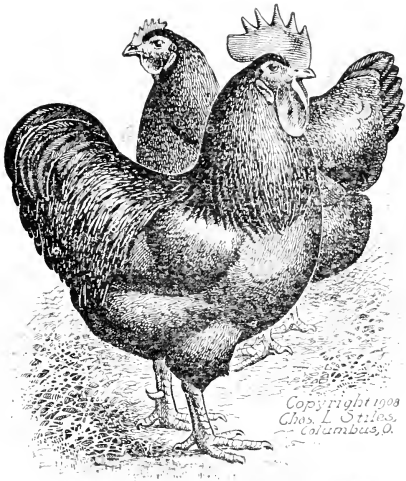
Rupture of the heart, or of the large blood vessels, may occur, usually from over-exertion or fright; it is most common in fat or large birds. Of course immediate death is the result; therefore no treatment can be given.



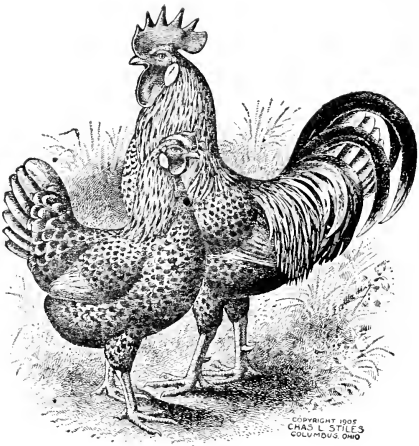
Houdans.



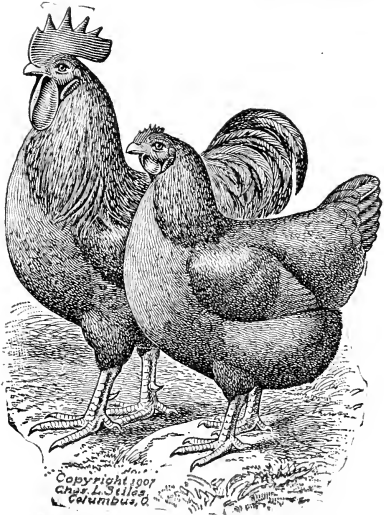
Rose Comb Buff Orpingtons.



Single Comb Black Orpingtons.



Mottled Anconas.



Single Comb Buff Orpingtons.

CHAPTER 5.

Diseases of the Nervous System.

Paresis—Cerebral Congestion or Congestion of the Brain—Apoplexy—Epilepsy or Fits.

PARESIS.

PARESIS is a partial or a complete loss of use of the legs. It is a condition often found in hens, especially in pullets which are apparently in the prime of health and have just begun laying, or are laying well.

CAUSE: Paresis so often occurs with hens or pullets which are fed heavily with rich, stimulating food with the view of forcing the egg production, that there is very little doubt but that this may be named as a principal cause; however, it may also be due to other causes, such as pressure on the spinal cord from tumors, inflammation, etc.

SYMPTOMS: The fowl will be noticed to walk staggeringly for a day or two and will gradually grow worse, until there is complete loss of the use of the

legs, and the bird will move about by flapping its wings. The appetite and general health are usually good. The condition often becomes so bad that the fowl becomes utterly helpless.

TREATMENT: Give a physic of 30 or 40 grains of Epsom salts in a spoonful of warm water; follow this by giving one or two drops of tincture nux vomica three or four times a day. The patient should be placed by itself where other fowls cannot annoy it and should be fed light food, such as vegetables and milk.

CEREBRAL CONGESTION OR CONGESTION OF THE BRAIN.

is an abnormal filling up of the blood vessels of the brain with blood. It is quite prevalent in fat or overfed birds.

It may be caused by exertion, especially when exposed to the hot sun. Cocks are supposed to be subject to it during breeding season. It may also associate certain diseases, or it may be the result of an injury to the head.

SYMPTOMS are giddiness and often convulsions. The giddiness is manifested by the staggering gait and, perhaps, by walking in a circle; the head is carried high and thrown backwards. Often, when caused by the hot sun, there are convulsions, or the bird may become unconscious for a short time and then begin to flutter.

TREATMENT: Cold water should be applied to the head freely, until the severe symptoms pass off; the

bird must be placed in a cool, comfortable, well-ventilated place, and a physic of 20 to 40 grains of Epsom salts in a spoonful of water be given, followed by two or three grains of bromide of potash three times a day as long as necessary.

The diet should be light and easily digested.

APOPLEXY.

Apoplexy is due to rupture of a small blood vessel in the brain.

CAUSES are very much the same as in congestion of the brain. The fowls are often found dead on the nest, when it is supposed to be due to hard straining; others will drop dead during violent exertion, or will drop dead from the roost.

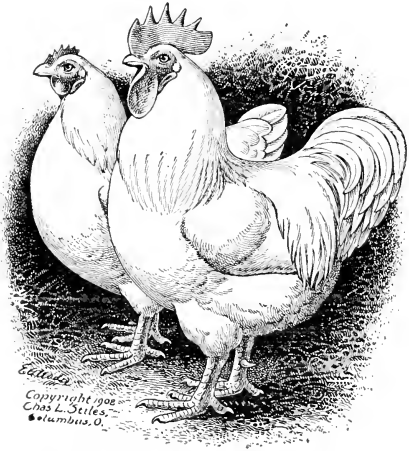
TREATMENT: The attack is so sudden that treatment cannot be resorted to, but for preventive measures the food should be limited, and not of a fat-producing nature, and the fat should be reduced by compelling exercise. Twenty grains of Epsom salts should be dis solved in a little water and mixed with soft feed twice a week for each fowl.

EPILEPSY OR FITS.

Epilepsy or fits is a condition characterized by a sudden loss of consciousness, with convulsions, fluttering, and jerking. It appears to be a sudden explosion of nerve energy, the cause of which is not well understood but is often due to reflex irritation from intestinal worms, or indigestion or it may be due to some abnormal condition, or tumor, in the brain.

The disease is not necessarily fatal, but the frequent attacks often make the fowl valueless and, unless the bird is a fine one, treatment will not pay, unless it is known to be due to worms. (See article on worms, page 44.)

TREATMENT, when the disease is not caused by worms, should be the same as that for Congestion of the Brain.



Single Comb White Orpingtons.

CHAPTER 6.

Diseases of the Kidneys and Organs of Reproduction.

Nephritis, Inflammation of the Kidneys—Male Organs and their Diseases—Female Organs, Their Anatomy and Physiology—Inflammation of the Oviduct—Prolapsus of the Oviduct—Egg Bound—Vent Gleet—Abnormal Eggs—Large or Two-Yolk Eggs—Eggs without Shells, or with Soft Shells—Blood within Eggs—Incubation of the Egg in the Hen—Worms or Parasites in Eggs—Eggs with Two Shells—Diseases of the Ovary.

NEPHRITIS OR INFLAMMATION OF THE KIDNEYS.

FOWLS, like other animals, have kidneys which are located near the lungs, along the spine. The excretions or urates (which is the white part of the droppings) are carried through the ureters, into the cloaca (the bird having no bladder) and voided with the faeces.

The kidneys occasionally become inflamed, which disease is properly called "Nephritis." The symptoms, however, are not sufficiently marked to diagnose the disease in time to attempt treatment. The author's object in giving the disease this passing notice is that there may be an occasional case found, upon post-mortem examination.

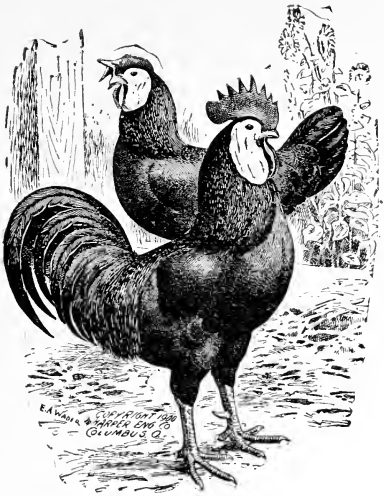
MALE ORGANS AND THEIR DISEASES

The genital organs of the cock are two testicles and the two ducts which carry the semen to the cloaca from which it is deposited into the female cloaca during the act of coition.

Water fowls, however, possess an organ which protrudes out a few inches during coition, through which the semen is deposited in the female cloaca; this is especially noticeable in the drake.

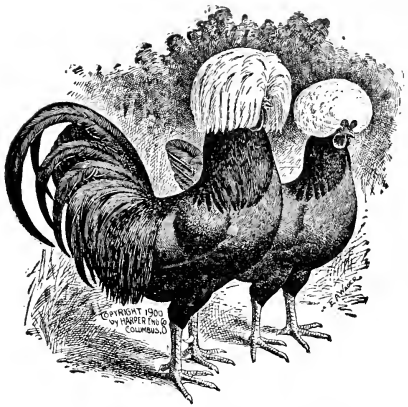
Sometimes the testicles become inflamed or diseased, which is very seldom recognized during life, but when the cock, during the breeding season, becomes weak, rapidly loses vigor, is inclined to sit, and does not care to associate with other fowls, some abnormal condition of the organs of reproduction may be suspected.

TREATMENT would consist of placing the patient alone in a quiet, comfortable coop. To an adult cock give one-half teaspoonful of Glauber's salts dissolved in two tablespoonfuls of water; follow by giving a few drops of sweet spirits of nitre every four hours,

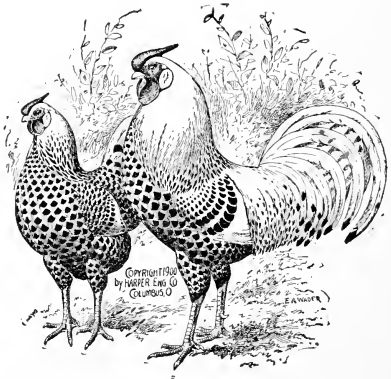


White Faced Black Spanish.

Blue Andalusians.



White Crested Black Polish.



Silver Spangled Hamburgs.

and one or two drops of tincture nux vomica three times a day. Feed green and light food.

Suppuration may take place, which condition cannot be diagnosed during life.

FEMALE ORGANS, THEIR ANATOMY AND PHYSIOLOGY.

The female organs of the fowl consist of the ovary, the oviduct and the cloaca; the cloaca being common to the organs of reproduction and to the digestive and urinary organs.

A brief description of the anatomy and physiology of the egg organs might be of some interest. The ovary is situated near the spine on the left side; it has the appearance of a cluster of yellowish nodules, and one by one, these nodules grow larger and become more yellow and finally the delicate membrane (Calyx) surrounding each ruptures and allows the nodule, which is called vitellus, to escape into the dilated portion of the oviduct, called the infundibulum, where it forms the yolk of the egg. The yolk is surrounded by a very delicate membrane called the vitelline membrane. Fertilization occurs soon after this body leaves the ovary and enters the oviduct. As it passes on down, it stimulates the walls of the oviduct, from which the albumen or white of the egg is secreted, and deposited on the yolk; the egg now passes on through the oviduct, with the small end downward; it reaches another dilated portion called the uterine or shell-forming part, where the limy substance

which forms the shell is secreted. The time required for the egg to pass from the ovary to the uterus, or the part where the shell is formed, is about six hours, and from twelve to twenty-four hours to complete the whole journey, from the time it leaves the ovary until it is laid.

INFLAMMATION OF THE OVIDUCT.

The oviduct, as previously explained, is not only the channel through which the egg passes from the ovary to the cloaca, but a great part of the egg is formed by passing through it.

This organ, in order to perform its delicate functions must necessarily be well supplied with blood vessels; therefore, it is quite subject to inflammation.

CAUSES: One of the most frequent causes is overfeeding with rich, stimulating foods, causing very frequent laying, and hence drawing large quantities of blood to these highly vascular parts. Other causes are such as an abnormally large egg becoming lodged in the duct, or the breaking of an egg in the duct, which may be caused by some injury.

SYMPTOMS: Eggs stained with blood are a symptom of slight congestion or inflammation. If the seat of inflammation is in the uterus, or portion where the shell is formed, eggs without shells are laid. Imperfect, small eggs, or yolks without the white, or eggs which contain no yolk, are an indication of inflammation of the oviduct.

The hen will strain, and show symptoms of laying, without depositing an egg; as the inflammation advances there will be fever; the bird will become weak and dull; the comb will turn pale; there will be loss of appetite and death will finally result.

TREATMENT, unless attempted early, is not successful. In those cases that can be treated in time, give twenty to forty grains of Epsom salts in a spoonful of water; follow by giving five to ten drops of fluid extract of viburnum prunifolium and a few grains of saltpetre, two or three times a day. The food must be light, and meat, pepper, ginger and such stimulants must be avoided.

PROLAPSUS OF THE OVIDUCT.

This is a condition in which the oviduct partially or completely drops down into the cloaca, or it may even protrude from the vent.

CAUSES: The trouble is mostly found in old hens that have been great layers and in which the walls of the cloaca have become distended and flabby, or it may result from continued straining, or from constipation, inflammation of the oviduct, or from constant laying of very large eggs.

SYMPTOMS: In partial prolapsus there is a red tumor-like appearance just inside of the cloaca, while in complete prolapsus a dark red colored mass protrudes from the vent. When the parts are thus exposed, inflammation becomes very intense and gangrene may set in, which soon results in death.

TREATMENF should be as prompt as possible. As soon as the first symptoms are noticed, take a pint of warm water to which add five drops of carbolic acid, and thoroughly cleanse the parts; then with oiled fingers, carefully replace the mass. Sometimes when the tumor is very large and painful, holding the vent in a pan of warm water, to which the above proportion of carbolic acid has been added, has good effects.

If there is much straining, a few grains of chloral hydrate, or a few drops of tincture opium, may be given in a teaspoonful of water, every few hours.

Place the hen alone and after there is no more straining give two drops tincture nux vomica in the food, twice a day; feed light food, such as boiled vegetables, milk, etc.

EGG BOUND.

Egg bound is the lodging of an egg in the oviduct.

CAUSES: It may be due to irritation of the lower portion of the oviduct causing dryness of the mucous membrane. Fowls being very fat is a condition that may produce such irritation.

Constipation of the bowels may sometimes obstruct the cloaca by filling it with fecal matter.

SYMPTOMS somewhat resemble those of inflammation of the oviduct, as the two conditions may sometimes be associated. The hen will go to the nest frequently and make efforts to lay. The most reliable symptom is feeling the egg with the finger, in the vent or cloaca.

TREATMENT: The cloaca should be cleared of all fecal matter. If it is full of a hard mass this must be softened with warm water; then, if the egg has not been retained too long, lubricating the parts by injecting a little olive oil is sufficient treatment. In more obstinate cases good results are often obtained by holding the fowl with the vent in a pan of warm water for twenty or thirty minutes. Where all other measures fail, the egg should be punctured, the pieces carefully removed and the patient fed sparingly for a few days.

VENT GLEET.

Vent Gleet or Cloacitis is a catarrhal affection of the mucous membrane lining of the vent and cloaca and in very bad cases the inflammation may extend to the oviduct or bowel.

CAUSE: It is due to germs and is therefore contagious; the disease is usually communicated from one hen to the other, by the male, during coition.

SYMPTOMS: The first symptoms noticeable are straining, and frequent attempts to evacuate the bowels, but, since these symptoms are also common to other diseases, further investigation should be made.

In vent gleet the disease spreads rapidly through the flock. The mucous membranes will be found hot, red, and swollen, and in a few days a discharge will take place which irritates the parts and soils the feathers about the vent, annoying the bird so that it will be seen picking the parts.

TREATMENT: The parts must first be thoroughly cleansed, by bathing carefully with warm water, in

which two or three drams of either borax or boracic acid have been dissolved in a pint of water. After cleansing thoroughly, dry by wiping with soft cloths; then, twice a day apply an ointment made by mixing one dram of boracic acid with one ounce of vaseline, or, instead of this, apply oxide of zinc ointment.

ABNORMAL EGGS.

Under this subject we will explain a few of the common abnormalities of eggs, such as small, deformed, and very large eggs, etc. Many years ago a superstitious idea prevailed that such eggs, especially the very small ones, were a bad omen, and they excited much curiosity. Some even entertained the idea that such eggs should be thrown over a building to overcome the bad foreboding.

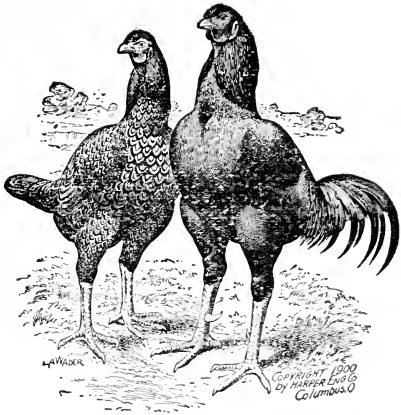
SMALL, OR INCOMPLETE EGGS.

These are usually no larger than a pigeon egg and contain very little, or no yolk.

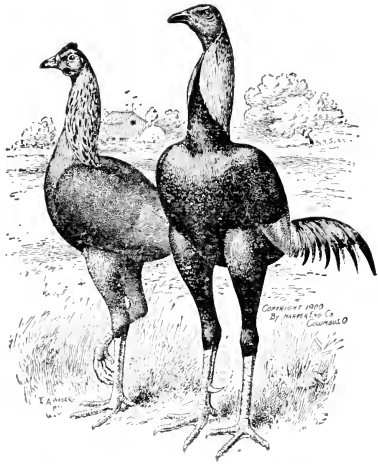
These are caused by irritation of the part of the oviduct where the albumen is secreted, an over amount being thrown out and then passing down into the uterine portion of the oviduct; a shell is formed around it, and the small egg is the result.

LARGE OR TWO YOLK EGGS.

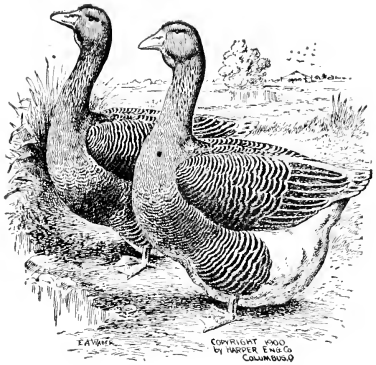
These are caused by two yolks entering the oviduct from the ovary at the same time; therefore, albumen and shell are formed around both. When such are hatched, double or imperfect chicks are the result. Some hens, for some inexplicable reason, are in the habit of laying double eggs.



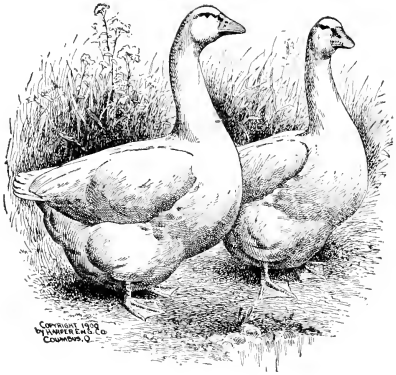
Cornish Indian Games.



Black Breasted Games.



Toulouse Geese.



Embden Geese.

EGGS WITHOUT SHELLS, OR WITH SOFT SHELLS.

As stated in the article on Physiology of the Egg Organs, the shell is formed in the uterine or dilated lower portion of the oviduct. Any irritation, or interference with the functions, of this part may cause it to cease secreting shell-forming material; hens being very fat is a common cause. Soft shells may, also, be the result of not providing the hens with sufficient lime or oyster shells.

BLOOD WITHIN EGGS.

Blood spots are occasionally found in eggs. This is the result of a slight hemorrhage from a small ruptured blood vessel in the oviduct or ovary. If the spot is on the yolk it would indicate that the hemorrhage occurred in the ovary; if it is on the white the hemorrhage occurred farther down the duct. The condition indicates great activity of the egg organs, which may be the result of over feeding or of feeding stimulants; therefore, light food should be fed for a while, and meat and stimulants with-held.

INCUBATION OF THE EGG IN THE HEN.

Occasionally eggs remain in the oviduct, possibly as the result of egg-bound, long enough to hatch.

WORMS OR PARASITES IN EGGS.

Worms or parasites, such as intestinal worms, are occasionally found within eggs. They are supposed to pass from the bowels into the cloaca and then find their way into the oviduct and become incased in the egg.

EGGS WITH TWO SHELLS.

Occasionally small, imperfect eggs are forced upward into the oviduct instead of being expelled, and there become surrounded with another layer of albumen and, finally, another shell.

The cause is the same as that of small eggs, and would indicate that the hen is overstimulated, or compelled to work harder than the egg organs can endure; consequently she should be fed light food, as bran and vegetables, and should be given rest.

A very good remedy for any of these abnormal conditions of the egg is to give the hen a few drops of tincture of corn-smut once or twice a day for a few days; or ten drops may be added to each pint of drinking water, once a day for a few days.

DISEASES OF THE OVARY.

The ovary of the fowl occasionally becomes diseased; it may become inflamed, which may terminate in gangrene. In other cases, tumors of considerable size may grow on the ovary, some of which may be of a cancerous nature.

Dr. Salmon in "Diseases of Poultry" likens these ovarian tumors to the yellow of a boiled egg.

Treatment is impossible, as the disease is never diagnosed while the fowl is alive, but is revealed only by post-mortem examination.

CHAPTER 7.

Diseases Affecting Various Organs.

Ergot Poison—Anaemia or Impoverished Blood—Tuberculosis—Bagging Down—Emphysema or Wind Puff—Rheumatism—Leg Weakness—Cramps in Young Fowls—Rickets in Young Chicks—Dropsy of the Feet.

ERGOT POISON.

ERGOT is a smut or mold found on grain, especially new, partially spoiled grain. Fowls roving on grain-fields after harvest, during wet seasons, are very subject to ergot poisoning, but it may also be produced by feeding grain which contains smut.

SYMPTOMS: Usually there is at first diarrhoea, followed by dizziness and paralysis or spasms, which may be followed by gangrene of the comb, beak, or feet and toes, which is characterized by these parts becoming dry and dead and finally dropping off. In chronic or slow ergot poison the gangrene may come on without any previous symptoms, as diarrhoea, etc.

TREATMENT: The cause must be removed at once, which, in mild cases, is sufficient. If the diarrhoea con-

tinues, give a few drops of tincture opium several times a day. When gangrene has started, the parts that are dead should be removed and the wound washed once or twice a day with a solution of Goulard's extract, two teaspoonfuls to one-half pint of water.

ANAEMIA OR IMPOVERISHED BLOOD.

This is a deficiency of some of the constituents of the blood.

CAUSES are those conditions that tend to reduce the vitality of the fowl, of which there are many, such as improper food, deficiency of food, exposure, indigestion, worms, lice, etc.

SYMPTOMS are paleness of the comb, wattles, and mucous membranes of the mouth and eyes, and general weakness; the fowl is easily exhausted, but the appetite may remain good.

TREATMENT: Seek the cause and remove it; feed a liberal supply of good clean nutritious food; allow plenty of sunlight, and give each fowl a few drops of tincture of iron and five drops of tincture quassia in a teaspoonful of water twice a day, or add the proper amount to the drinking water.

TUBERCULOSIS.

Domestic fowls and birds as well as other animals are subject to this disease. It is quite prevalent in some flocks and, when once affected, there is no successful method of eradicating the disease, except by destroying diseased fowls.

CAUSE: Tuberculosis is due to germs (the tubercular bacilli).

SYMPTOMS: The symptoms of tuberculosis in fowls are, for the most part, common to other diseases, and the only method of making a positive diagnosis is by microscopical examination of suspected growths or nodules; if the bacillus tuberculosis is found, the nature of the disease can no longer be doubted.

Fowls afflicted with tuberculosis show unthriftiness, emaciation and rough plumage. Nodules often appear on the face, about the eyes, or the joints of the legs or wings show swellings or small tumors which break down and ulcerate. Post-mortem examination shows white or grey tubercular deposits in the walls of the intestines, lungs and liver. These deposits vary from the size of a millet seed to that of a pea, and may be hard and lime-like, or soft and cheesy, or may even contain small quantities of pus.

In house parrots the external manifestations of disease is quite common; horny growths appear on the face, about the eyes, or on the bill; the wings and toes often present nodules that are characteristic. The tuberculosis of fowls is not easily communicated to mammals, but that of parrots seems to be identical with tuberculosis affecting man, and is believed to be capable of being transmitted to the latter.

TREATMENT: Since the disease can be transmitted from one fowl to another, by close association, and since no cure is possible, all affected birds should be

destroyed, and the runs and poultry houses thoroughly disinfected and kept clean and dry, with plenty of sunlight, for several months. Where this is done new fowls can be admitted at the end of six or eight months with a fair assurance that the new stock will remain healthy.

BAGGING DOWN.

This is a condition that is seen mostly in old hens as the result of their being too fat. The only treatment is short rations of light food, which encourages exercise. Such hens are fit for table use, as this is not a disease.

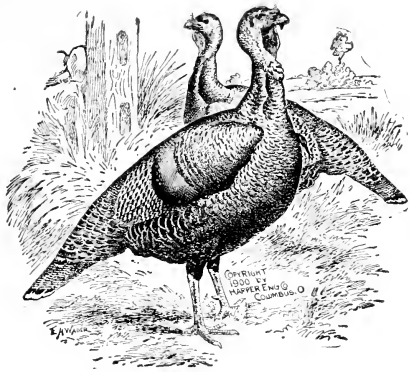
EMPHYSEMA OR WIND PUFF.

This is a peculiar condition that affects young chicks and is characterized by the collecting of air or gas under the skin, making them appear like a ball full of wind.

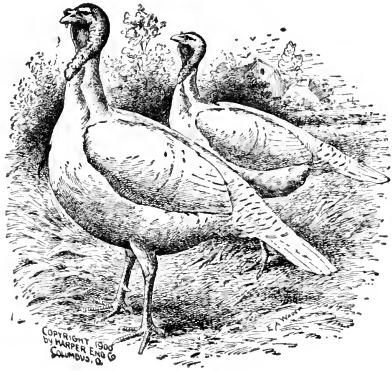
CAUSES: It may result from an injury, or from eating certain decomposed or fermented food; chicks eating starch has been known to cause it.

When due to an injury, such as the chick being trampled by the mother, or by large fowls, the air is supposed to escape from the lungs, through the air sacks and hollow bones, and to collect under the skin.

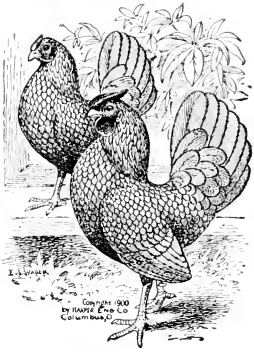
TREATMENT: See that they eat no soured food, and allow only a small quantity of good, clean food. Add five drops of carbolic acid to two tablespoonfuls of water and give one-fourth teaspoonful every two hours; also, mix charcoal with the feed.



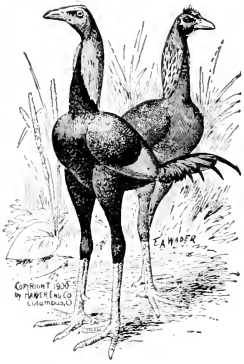
Bronze Turkeys.



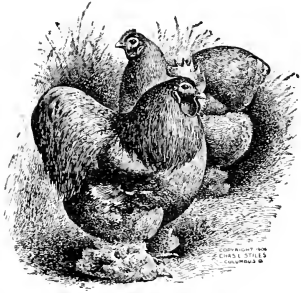
White Holland Turkeys.



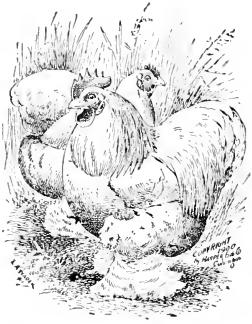
Golden Seabright Bantams.



Black Breasted Red Game Bantams.



Buff Cochin Bantams.



White Cochin Bantams.

Open the skin with a needle or small shears, to allow the escape of gas.

RHEUMATISM.

Acute rheumatism is a constitutional disease, excited by dampness and cold.

SYMPTOMS: There may be some fever; bowels are usually constipated; there is pain shown by spasmodic jerking of the legs, and often the fowl is unable to walk; some of the joints are swollen and, usually, the swelling and pain shift from one joint to another; this is one of the most reliable symptoms. In severe cases the enlarged joints will ulcerate, or become hard.

TREATMENT: Remove the cause by placing the bird in a warm, dry room; give twenty grains of Epsom salts in a tablespoonful of warm water; follow in a few hours by giving one grain of quinine and two grains of salicylate of soda, four times a day.

Apply equal parts of oil of wintergreen and soap liniment to the swollen joints once or twice a day.

LEG WEAKNESS.

The trouble among fowls which is known as leg weakness is only a symptom of some other condition, but, because it is such a familiar term and occurs so frequently, it is necessary to give it space.

CAUSES: In young chicks it may be due to confinement on board floors or in damp coops, or it may be the result of improperly heated brooders, bottom heat being especially bad.

In adult fowls the heavier breeds seem to be most subject,—especially the males,—but by no means can it always be attributed to any of the above named causes, because in some cases it may be due to over-feeding or to rheumatism, while in other cases the cause is obscure.

Leg weakness is quite prevalent in ducks, and is caused, in most cases, by feeding too much of such food as corn, buckwheat, etc., or, in the young, by allowing free access to cold water, or by over-crowding.

SYMPTOMS are, as the name would imply, weakness, lameness, disinclination to move; the appetite is usually good, and the bird will usually eat all the food within reach, then move a few steps, and again sit down and eat.

TREATMENT: If any of the above named causes exist, remove them at once; also examine their feet, and, if anything should be found, treat as directed under the existing condition. Feed such food as bran, rice, green food, milk, etc.

Give an adult fowl one or two drops of tincture nux vomica and a few grains of salicylate of soda three times a day. To the young give smaller doses according to age.

The patient should be put in a dry comfortable place where it is not annoyed by other fowls.

CRAMPS IN YOUNG FOWLS.

Young fowls occasionally become crampy, which is characterized by the legs drawing up or cramping together of the legs and toes.

CAUSES: It is quite frequently caused by feeding too highly concentrated food and too much of it. In young ducklings or goslings it may be due to an error in feeding, or to allowing them to get into cold water when quite young.

In brooder chicks it can sometimes be attributed to keeping the brooder quite warm, then allowing the chicks to run out on the cold, damp ground or floor.

TREATMENT: The cause must be first sought, and removed, if possible. If it is due to feeding too highly concentrated food change the diet and feed less; plenty of green food and some beef scraps should be fed.

If it is due to allowing water fowls to get into cold water, remove this cause; if due to over-heating the brooder, or to chicks becoming chilled, this must be remedied.

For medicinal treatment, add ten drops of tincture belladonna and ten grains of salicylate of soda to two ounces of water and give each chick one-half teaspoonful three times a day, and keep them in a warm, dry, comfortable place.

RICKETS IN YOUNG CHICKS.

Rickets is a constitutional disease, usually associated with derangement of digestion, nutrition and assimilation. It is not as frequently met with in young chicks as in other animals; however, it is occasionally seen. It is really a deficiency of earthy material in the bony tissue.

SYMPTOMS are the loss of the use of the legs; the toes will draw together as in cramps; but the most

prominent are softening of the bones, which is shown by the legs becoming crooked, the beak appearing soft and often turning sideways; either the lower or upper beak, more commonly the lower, may become enlarged and drawn out of shape so that the chick will not be able to pick food.

CAUSES: This trouble can usually be attributed to improper feeding, bringing on digestive disorder, or to feeding food that does not supply the proper nourishment. It is also quite frequently found among chicks that are kept indoors exclusively, and do not have access to any food containing lime or earthy material.

TREATMENT: Give the chicks good hygienic surroundings; feed a variety of good food; and mix a teaspoonful of phosphate of lime in soft feed once a day for every thirty chicks; give lime water to drink, once a day, to which add sufficient tincture gentian so that each chick will get several drops.

DROPSY OF THE FEET.

Occasionally we find a condition where the feet seem to swell as in dropsy.

CAUSES: It can usually be attributed to over-feeding and insufficient exercise.

TREATMENT: Remove the cause and feed light food, such as bran mash and give the fowl a drop or two of tincture digitalis and a few grains of acetate of potash three times a day.

CHAPTER 8.

Diseases Pertaining to Surgery.

Wounds and Bruises—Abscesses—Corns and Bumble Foot—Broken Bones—Frost Bites.

WOUNDS AND BRUISES.

WOUNDS and bruises are not inflicted upon fowls as frequently as upon other domestic animals, but do occasionally occur.

TREATMENT: Stitching of a wound in a bird is seldom necessary, except when large pieces of skin are torn loose. In such cases wash the wound with warm water to which one-half teaspoonful of carbolic acid has been added to a pint of water used; remove all particles of dirt and feathers; then stitch the edges of the skin together nicely, with ordinary white thread, if surgeon's silk is not at hand. If boracic acid or soda is at hand, a little may be dusted on the raw surface before stitching.

Slight wounds will heal very rapidly and seldom need any treatment; if any is attempted, washing with the carbolic acid water, and then keeping boracic acid or soda dusted on, is sufficient.

Bruises, where there is no abrasion of the skin, are best treated by the application of hot fomentations, as hot water, or hot bran or salt held on in small sacks.

ABSCESSES.

Abscesses consist of the accumulation of pus within circumscribed walls, and may be located in different parts of the body.

CAUSES: Deep-seated bruises are the most frequent causes, but inflammation, and consequent suppuration, or abscesses of certain glands, are sometimes the result of infectious diseases.

SYMPTOMS: The first is a hot, painful swelling in which pus soon forms, which is manifested by the center becoming soft.

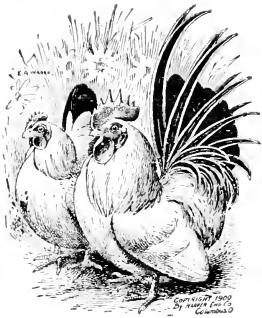
TREATMENT: As soon as the soft place can be felt, it should be cut open and washed out with carbolic acid water as often as necessary.

CORNS AND BUMBLE FOOT.

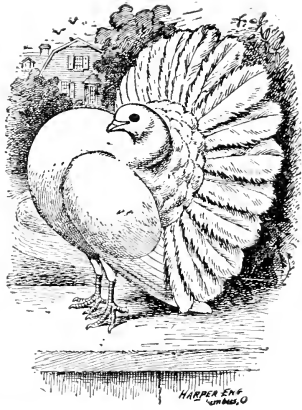
Corns are bruises on the under surface of the feet.

CAUSES: Alighting from high roosts or being continually confined on hard floors are the most frequent causes, especially with the heavy breeds. Another cause is narrow perches, which it is necessary for the bird to grasp tightly all night in order to keep its position.

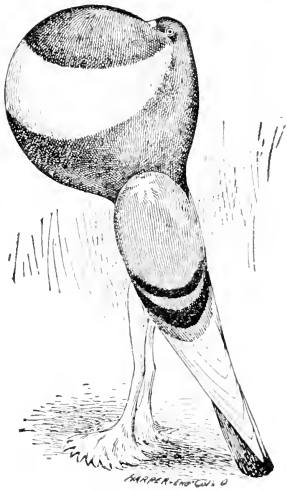
SYMPTOMS: There is lameness, thickening of the skin on the bottom of the foot, and, frequently, swelling, with great pain, followed by the formation of pus, when it is termed



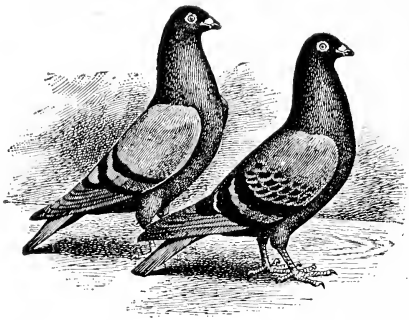
Japanese Black Tailed Bantams.



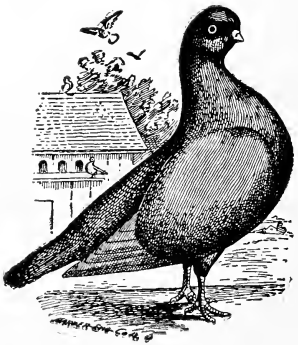
Fantail Pigeon.



Pouter Pigeon.



Homing Pigeon.



Tumbler Pigeon.

BUMBLE FOOT.

In this stage the swelling will often extend up between the toes, and walking becomes very painful.

TREATMENT: When there is only a simple corn or a hard, thickened skin on the bottom of the foot, this should be pared off and tincture iodine applied several times; but where there is a painful, deep-seated abscess, which would be "bumble foot," it should be poulticed with scalded bran or flaxseed until the inflammation and soreness are relieved, or until it appears soft, which would indicate pus, when it should be opened with a sharp knife and the pus and core removed, and the wound filled with boracic acid and alum, in equal parts.

By following this treatment and keeping the bird on a clean, dry, soft floor for a few days, a good recovery will usually be the result, if the cause has been removed.

BROKEN BONES.

Fractured bones frequently occur in fowls, and, if the fracture is located so that it can be bandaged, union will take place very readily.

TREATMENT: Carefully straighten the broken bone and get it as near the natural position as possible; then cover evenly with a thin layer of cotton; over this, lay splints of heavy, moistened paste-board; then wrap evenly with a narrow strip (about one inch) of muslin. Plenty of bandage should be applied, and it should extend well past the fracture in both direc-

tions, and should be tight enough to keep the bones together well, but not so tight that it will interfere with circulation. Place the patient in a comfortable coop, away from the other fowls.

FROST BITES.

Frozen combs, wattles and toes are very common in our Northern climate.

TREATMENT: The best treatment, which is almost useless to mention, is avoiding the cause; that is, providing a sufficiently warm house, but this cannot always be done.

When the parts are only slightly frozen, and if noticed soon, they should be bathed or immersed in cold water just drawn from the well or spring. Heat should by no means be applied, neither by bathing with warm water, nor by taking the bird near a warm stove; a cool cellar is better.

After the frost is taken out by using the cold water, apply of a mixture of Ichthyol one part, and Glycerite of tannic acid, three parts, once or twice a day; or, if this cannot be had, turpentine, one part, mixed with six parts vaseline, is also good.

When the parts are severely frosted, or when the frost is allowed to come out of its own accord, there is danger of the frozen parts dying and falling off, and no treatment will prevent this. When the wattles become puffed and filled with a watery substance, they should be cut off immediately as far as frosted, which will give great relief, and healing will take place rapidly.

CHAPTER 9.

Diseases Affecting the Skin.

Chicken-pox—Favus—Mange or Depluming—Scaly Legs—Lice, Mites, Etc.—Where do Lice Come From?

CHICKEN-POX.

CHICKEN-POX, sometimes called sore-head, affects all domestic fowls.

CAUSES: This disease is supposed to be due to a micro-organism and is therefore contagious. Filthy, wet poultry-houses greatly favor its development.

SYMPTOMS: The disease affects the head mostly; usually the eyes and about the beak, comb and wattles; it is characterized by the formation of yellowish-gray, warty-appearing nodules, from the size of a mustard seed to that of a grain of corn. Sometimes, the eyes are covered with nodules so as to cause blindness.

The general health is usually not much affected at first and in some cases the nodules will dry off and the fowl will recover rapidly, while in others they will gradually grow worse and finally die.

TREATMENT: Affected birds should be removed from the flock and the necessary sanitary precautions taken.

Give the sick fowl a few grains each of sulphur and cream of tartar three times a day and apply either oxide of zinc ointment or equal parts of Glycerite of tannic acid and compound tincture of Benzoin to the nodules twice a day.

FAVUS.

Favus, sometimes called "baldness" or white comb, is a parasitic disease, similar to ring worm, affecting principally the comb and wattles, but which may spread to any part of the body. The disease is contagious because of the parasite or fungus, "Achorion Schonleinii," being easily communicated from one bird to another.

SYMPTOMS: The principal symptoms are the dirty, white, powdery crusts of a mousy odor, forming on the comb and wattles, and in a few weeks spreading over the head and neck and, if unchecked, to other parts of the body. Finally, the feathers will become affected and drop out or break off and, if let go, the bird's general health, which is at first unaffected, becomes affected and there will be weakness, loss of appetite, loss of flesh, diarrhœa and finally death.

TREATMENT: The well and afflicted fowls must be separated, the roosts and walls disinfected by scalding or whitewashing, and air-slacked lime sprinkled over the floor.

Then, take the afflicted bird and carefully scrape the scabby accumulation from the affected parts and apply one of the following parasiticides:

Tr. Iodine.....2 dr.
Oil of Tar.....6 dr.
Alcohol .....8 dr.

Mix and apply two or three times a week.

Or in one pint of soft water dissolve all the hyposulphite of soda it will take up, and wash with this once a day. The latter is very cheap and effectual. Either treatment need be used only until the parts are normal or healthy looking, which is usually accomplished in a short time.

MANGE OR DEPLUMING.

Mange or scabies, very commonly called "depluming" is caused by a parasite, "Sarcoptes Laevis."

The disease is characterized by the feathers dropping out or breaking off in spots on any part of the body; most commonly, perhaps, over the rump, thighs and belly.

TREATMENT: First, separate the well from the affected, and, for treatment, those dips or preparations advertised, such as "Zenoleum" or "Chloro-naptholeum" are among the best applications. They should be applied as directed.

Another very effectual remedy is the following, applied every few days:

Alcohol .....2 oz.
Oil of Tar ..... 6 oz.
Water.....1 qt.

The roosts must also be washed with the preparation or scalded with boiling water, floors scrubbed, and

sprinkled with fine lime, or sprinkled with the preparation used. The walls should be whitewashed.

SCALY LEGS.

Scaly legs is a very common disease; it is due to a parasite, the "Sarcoptes Mutans," which burrows under the scales and multiplies very rapidly.

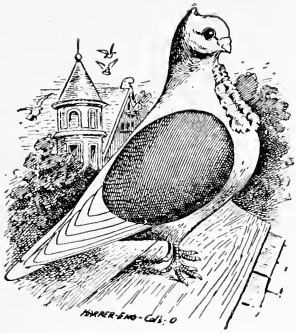
The disease is shown by a rough, scabby deposit on the legs, caused by yellowish exudate drying, and forming a crust.

TREATMENT: The legs should be soaked in warm, soapy water; then rubbed with a brush, so as to remove the scales and expose the parasite; then, either of the remedies given for "Mange" may be applied or, a very effectual ointment may be made by mixing a teaspoonful each of oil of tar and sulphur with a tablespoonful of clean, unsalted lard; this should be applied every other day. If the disease is general, the same sanitary precautions should be resorted to as are recommended for Mange.

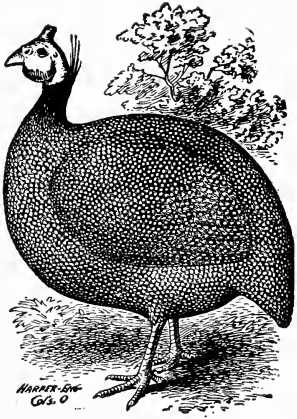
LICE, MITES, ETC.

There are no less than thirty-five or forty different varieties, some being very annoying, others not so much.

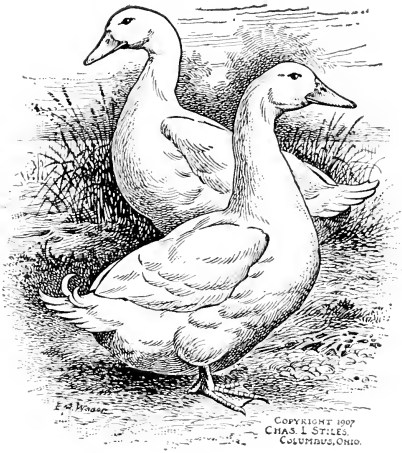
Some affect the skin by gnawing; others suck the blood; while some live on the feathers and scales of the skin; these latter, of course, do not annoy the bird nearly so much as those that irritate or gnaw the skin. Still others are found in the air sacks to which we have referred in the article on Pneumycosis.



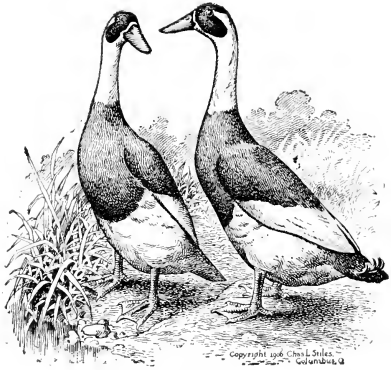
Turbit Pigeon.



Pearl Guinea.



Pekin Ducks.



Indian Runner Ducks.

The small red mite is perhaps the most common and annoying, especially during the night, when it feasts on its host by pricking the skin and filling itself with blood, while during the day it is found in large numbers in cracks, crevices, etc., in the walls, roosts and nests, or in the litter, if much of this is allowed to accumulate under the roosts.

Another very annoying variety is the large (sometimes called the gray head) louse. This variety is very destructive to young fowls; a few may destroy a young bird. Their presence is detected principally on the head, and by their white nits at the base of the feathers on the head and about the eyes.

The long, slender louse is one of the most common found on the fowl during the day, or when an examination is made; they are usually very plentiful about the vent, under the wings, along the belly, where their nits and debris will be found collected about the base of the feathers. This louse runs very rapidly and will soon disappear; therefore, searching must be done very carefully.

Those that do not gnaw or bite the skin, but affect the feathers, are characterized by the feathers appearing dead and breaking off, and by their excreta collecting about the shafts of the feathers.

WHERE DO LICE COME FROM?

The old supposition that lice are spontaneously developed in filth and litter should no longer be maintained; however, it is true that such unsanitary condi-

tions favor their development, but it is a known fact that we cannot produce lice, and that animate beings must come from like animate parents; hence, with whatever kind of lice the fowl is infested, the same originated from that particular species.

When the rapidity with which lice multiply is taken into consideration, we can readily see how, under favorable circumstances, myriads of lice may develop in a short time, from only a few lice. According to Leuwenhoeck, quoted by Newmann, a single female louse may, in eight weeks, become grandmother of 10,000 lice and, according to some authorities, the third generation of a single louse may reach 125,000.

SYMPTOMS: The diagnosis of lice is easy if a careful search is made by parting the feathers and examining the skin, especially on the head, about the vent, and under the wings and belly. Suspicion should be aroused by such symptoms as the birds pecking themselves, being restless on the roosts, leaving the nest when hatching, comb and wattles becoming pale; or sometimes, fowls are so badly infested that they become sick or succumb to a bad diarrhoea, which is often mistaken for cholera, but has no relation, whatever, to cholera; when such symptoms exist, fowls, and all crevices about the roosts and nests should be carefully examined.

TREATMENT must be persisted in and repeated every week or two, because a few lice and nits left will soon develop a new crop.

A good supply of dry sand or road dust should always be kept in a box in a warm, sunshiny place where the fowls can bathe at will; a small amount of sulphur or insect powder added to the dust will improve it.

For the large head louse on small chicks, the application of clean unsalted lard in which a few drops of oil of sassafras has been mixed with each ounce, is very effectual; a very effectual dip can be made by mixing two or three ounces of creolin in a gallon of warm water; the fowl must be held in the water for at least a minute and all the parts, even the head, must be wet, but, of course, the head must not be immersed into the dip; after applying lard, and after dipping, the birds must be kept in a warm, dry place for some time.

Louse Killers, in powder form, or sulphur, are also good, but sulphur must not be used on small chicks. The roosts and nests should be carefully examined every week or two and, if lice are found, they should be scalded with boiling water, or saturated with coal oil, and the walls should be whitewashed at least once or twice a year.

Fine road dust thrown about in the house occasionally, is quite destructive to lice; fumigating, by burning sulphur in the closed house, when fowls are out, will destroy mites. This is very good for small coops that cannot be easily gotten into. The droppings must be removed often, especially during warm weather.

To destroy those that affect the feathers only, either the creolin dip, or the oil of tar, alcohol, and water treatment for mange, is very effectual.

Chickens which dust freely in wood ashes are seldom troubled with lice.

CHAPTER 10.

Vices or Habits.

Feather Pulling and Eating—Egg Eating—Comb Eating

FEATHER PULLING AND EATING.

WHEN fowls pull their own feathers, suspicion of lice or some skin disease should be aroused and a careful examination should be made.

But occasionally the habit, or vice, of pulling and eating one another's feathers is acquired.

CAUSES: An abnormal appetite, often caused by feeding an insufficient variety of food, or by close confinement and idleness; or it may be the result of not feeding meat in any form.

TREATMENT: If possible, free range should be allowed; if this is impossible, exercise should be encouraged by providing a scratching pen, in which small grain should be thrown in straw or chaff. A piece of salty meat hung just so they can reach it, by making some exertion, is sometimes effectual. The food should be of as much variety as possible, with plenty of meat and cut bone.

An ointment made by mixing a little aloes with lard and applying it to the parts where they pull feathers, mostly, has a tendency to disgust them, because of its very bitter taste. But, where there are only a few feather-eaters in the flock, they should be disposed of before the whole flock acquires the vice.

EGG-EATING.

This is a very troublesome vice and is often difficult to check.

CAUSES: In a great many cases the vice begins from the eggs being too soft shelled and easily broken in the nests, when they will be eaten, not only by the hen that breaks them, but she will carry pieces of shell about the hen-house and others will get the taste and soon acquire the vice.

Idleness and insufficient supply of meat, cut bone and oyster shell may be considered as indirect causes.

TREATMENT: All possible efforts must be made to prevent hens from getting started, by keeping straw or something soft in the nests, and by having the nests arranged so that the hens will not be compelled to jump on the eggs.

A variety of food, with a liberal supply of shell-forming material and meat, should be supplied, such as oyster shells, lime, cut bone, meat scraps, etc. The hens should be compelled to work, either by giving free range or by providing a scratching-place.

Artificial nest eggsshould be placed about floor of the the hen-house, as well as one or two kept in each nest.

If the above methods are not sufficient to check the vice, nests must be arranged so that the eggs will drop out of sight, or so that the hen cannot get at them. Funnel shaped nests with an opening in the center through which the eggs will drop into a soft, padded box or drawer are very good. Another method is a long box, opening at one end only, and low enough so that the hen cannot stand erect while back in the nest. This has two good features; namely, its being low and somewhat dark.

COMB-EATING.

Pecking one another's combs and wattles, especially the hens pecking the cock's, is a vice fowls occasionally contract and, when they once taste the blood, the habit will grow worse.

CAUSES are not unlike those of the other vices; namely, idleness and an insufficient meat diet.

TREATMENT: Remove those that have bloody combs for a few days, or until the combs are partly healed or dried; then apply a preparation made by mixing one part each of tar and powdered aloes with four parts of lard; supply plenty of fresh meat, and encourage exercise.

APPENDIX.

Feeding Young Chicks—Feeding and Caring for Young Turkeys—Feeding for Eggs—How to Hasten Molting—How to Break up a Broody Hen—The Number of Hens that Should be Mated with One Male—Time Required in Mating to Insure Pure and Fertile Eggs——Things to be Remembered.

FEEDING YOUNG CHICKS.

THE first week or ten days is perhaps the most critical time of a chick's life because of the danger of digestive disorder.

Almost every poultry-raiser has his own method of feeding, and many are good. I shall attempt to give only a few. In my own experience I have had excellent results from feeding dry feed only, beginning when the chicks are twenty-four hours old, (as they should never be fed before twenty-four hours) by giving rolled oats and fine dried bread crumbs about every four hours; plenty of fine sand should be kept before them from the start. To this ration may be added, in a few days, fine cracked wheat screenings or ready mixed chick feeds, of which there are many different brands in the market. A little later, cracked corn is also given.

A great many poultry-raisers, who adopt the dry feeding method, supply the food with automatic feeders, especially after the second or third week, which perhaps comes closer to nature than feeding at a certain time or at intervals.

After the first ten days, milk may be given quite freely, also fresh meat in small quantities. For those who do not prefer the dry feeding method, the following makes a good "Bill of Fare:" Stale bread soaked in sweet or scalded milk, to which is added some hard boiled eggs, shell and all, finely chopped. Clean water should be kept before them constantly in drinking fountains.

For broiler feeding, one mash a day after the second or third week will somewhat hasten their growth, but when mash feeds are given, the birds must be watched closely for indigestion or bowel trouble.

A little powdered charcoal mixed with the mash feed will help to prevent indigestion.

FEEDING AND CARING FOR YOUNG TURKEYS.

The first few weeks of a young turkey's life is a very critical period. The first week, the mother and young must have a warm place that is free from draughts of air and dampness and in which they will be undisturbed by other fowls.

The food, for the first three weeks, should consist of sweet milk (fresh from the cow is best,) very hard boiled eggs, cracked wheat or screenings, and bread

crumbs. During this time, if the weather is warm, they may be let out during the middle of the day, being careful that they are kept near the coop and shut in before sunset, as dew is very injurious to young turkeys.

They should be watched closely, so that they will not get on their backs, because it is often impossible for them to arise from this position and they will die if left alone.

Ants are great enemies to young turkeys; they are injurious when eaten or may pest the birds by getting on their heads; therefore, care must be taken that the coop is not put near ant hills.

Food for the fourth week may consist of oat meal sour milk curd in small quantities, wheat screenings, table scraps, taking care that these do not contain too much salt. After the eighth week, they may be given their freedom; they may be fed grain in the morning if they do not have access to grain fields.

FEEDING FOR EGGS.

When fowls have free range, or the run of the farm, very little attention need be paid to feeding, with regards to a balanced ration. But, when closely confined, the food must be of such a nature that it will supply the constituents of the eggs, as well as maintain the health of the hens.

Below is the daily ration required for a laying hen according to Bulletin No. 84, of Rhode Island Experiment Station:

Protein .....12 grams,
Fat .....7 grams,
Carbohydrates .....45 grams,

Nearly all grains have some value as poultry food, but wheat, oats and barley undoubtedly stand at the head as egg producers.

The following is an excellent combination for dry or hopper feeding, about four or five ounces being a daily ration for a hen:

Wheat .....10 lbs.
Oats.....4 "
Barley.....3 "
Buckwheat..... 3 "
Sun Flower Seeds.....2 "
Corn.....3 "

Another very successful method is giving a mash in the morning as early as possible; then, during the day, some of the above mixture (without the corn) may be thrown into straw or chaff in a scratching-pen and, for evening feed. all the corn may be given they will eat off the cob. Meat, not to exceed ten per cent of the daily ration, and green food should always be supplied during the winter or when closely confined.

Stimulants, such as pepper or ginger, are, perhaps, of some benefit, but must be fed very sparingly, because overdoing the matter will produce disease, such as liver trouble, etc.

When rich, yellow yolks are desired, plenty of clover must be fed either green or dry. The clover meal now on the market is a very convenient way of supplying this useful adjunct.

Lime must be provided in some form; it is estimated that one pound of oyster-shells contains sufficient lime for the shells of seven dozen eggs.

HOW TO HASTEN MOLTING.

Sometimes it is desirable to hasten molting, so as to get the hens well feathered and in laying condition by late fall or early winter.

To accomplish this, the hen should be fed very sparingly and kept confined for a few weeks, or until she has entirely ceased laying and is in a somewhat depleted condition; then she should be fed plentifully with a ration that is highly nitrogenous, so as to encourage the growth of new feathers. Oil meal, pea meal, ground oats, wheat, milk, and beef scraps would be among the best that could be fed. Results will be much more satisfactory, if several varieties are fed, than when only one kind of grain or feed is given.

When beginning to feed a fowl that has been partially deprived of food, care must be taken that it is not overfed, but it should be fed cautiously and the amount gradually increased.

HOW TO BREAK UP A BROODY HEN.

One of the quickest methods of breaking up a persistent broody hen is to place her in a small coop with a wire screen bottom, for 36 to 48 hours, without feed or water. The coop must be up off the floor so as to allow the cool air to pass beneath the hen. Of course, in cold weather the coop must not be put in a place so cold that the hen will freeze her feet.

This treatment may seem a little cruel but it is not nearly as severe as some other methods that are often resorted to with little or no effect. Another very effective method is to set her in a bucket containing several inches of water, for several hours.

THE NUMBER OF HENS THAT SHOULD BE MATED WITH ONE MALE.

The number of hens that can be safely mated to one male depends upon the breed and vigor of the male, but the following is a good rule to follow: The small, or Mediterranean breeds, such as Leghorns, Minorcas, etc., may be mated from twelve to fifteen hens to a healthy cock.

The medium breeds, such as Plymouth Rocks and Wyandottes, ten to twelve. The very heavy breeds, such as Cochins and Brahmas, eight to twelve hens to a cock.

TIME REQUIRED IN MATING TO INSURE PURE AND FERTILE EGGS.

The subject of mating is not exactly agreed upon by all poultry raisers, yet in most cases when the hen has been mated ten days, the eggs may be considered pure; but perhaps the surest way is to change hens from one male to another at the close of an egg litter.

The following are a few tests made by several different stations:

Not more than 30% of eggs will hatch, when gathered during the first week after mating; from 40 to 80%, when gathered during the second week; from 50 to 90%, when gathered during the third week.

From these tests, the conclusion may be formed that the mating should be at least three weeks, in order to get the greatest percentage of fertile eggs.

THINGS TO BE REMEMBERED.

High perches are not desirable, nor should some be higher than others.

Charcoal and grit should always be kept before fowls.

Plenty of clean litter should be supplied.

Over-crowding should positively be avoided.

A dust bath should always be provided.

The breeding stock must be healthy to insure fowls of strong vitality.

Do not neglect to give plenty of fresh water.

The droppings should be removed daily.

Never over-feed.

Remember that fowls confined must be provided with a liberal supply of green food.

Keep up a continual war against lice.

Some poultry raisers advocate sowing a patch of rape for young growing chickens.

Oats sprouted to two or three inches makes excellent green food for winter.

A male bird under a year old is termed a cockerel, while one over a year old is called a cock.

A female bird less than a year old is a pullet; over a year old, a hen.

A broiler should not weigh over two pounds and should be from six to twelve weeks old.

A roaster weighs four or more pounds.

A turkey under a year old is termed a poult.

A capon is a male bird deprived of its generative organs.

A female deprived of its egg organs is termed a poulard.

One male and two females constitute a trio.

From six to fourteen females and one male is usually termed a breeding pen.

Thirteen hen's eggs constitute a sitting; however, some poultrymen give fifteen.

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